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PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

EGYPT LIFE RED SEA PROJECT

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EGYPT LIFE RED SEA PROJECT

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ABBREVIATIONS AND ACRONYMS

a.s.l.	Above sea level
BP	Best Practice
CAA	Competent Administrative Authority
CBFL	Coastal Building Front Line
CDA	Community Development Association
EA	Environmental Assessment
EEAA	Egyptian Environmental Affairs Agency
EEPP	Egyptian Environmental Policy Program
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMU	Environmental Management Unit
ERs	Executive Regulations
GIS	Geographic Information Systems
HEPCA	Hurghada Environmental Protection and Conservation Association
IDC	Integrated Development Corporation
IEE	Initial Environmental Examination
LRS	LIFE Red Sea (project)
M&E	Monitoring and Evaluation
NGO	Non-Governmental Organization
NPD	Nature Protection Department
PEA	Programmatic Environmental Assessment

PV	Photovoltaic (solar)
RSG	Red Sea Governorate
SPA	Shore Protection Authority
SRS	Southern Red Sea
SWM	Solid Waste Management
TA	Technical Assistance
TDA	Tourism Development Authority
USAID	United States Agency for International Development

Executive Summary

Introduction to the Project

The LIFE Red Sea (LRS) project focuses on increasing sustainable economic growth in the Red Sea Governorate by promoting sustainable tourism. The project builds on prior efforts and addresses the key challenges for the sustainable development of the Egyptian Red Sea. The project works with three Government of Egypt partners, namely: the Egyptian Environmental Affairs Agency (EEAA), the Tourism Development Authority (TDA), and the Red Sea Governorate (RSG). The project's geographic focus is the Southern Red Sea Zone, with terrestrial/desert, coastal and marine sites identified for possible interventions.

The LRS overall goal is to promote sustainable natural and cultural tourism development in the Southern Red Sea region that meets the needs of present tourists and local residents, while protecting and enhancing economic opportunities for the future. The associated objectives are:

- Objective 1: To engage local Red Sea residents equitably in the economic, social and cultural benefits generated by tourism
- Objective 2: To enhance competitiveness of Egypt in the fast growing international natural and cultural tourism market
- Objective 3: To ensure protection, management and sustainable use of the natural and cultural assets upon which the RSG tourism industry and local livelihoods are based

The LRS project has three sectoral components and one project support or cross-cutting component, all focused on supporting economic growth in the Red Sea Governorate. The project focuses primarily on technical assistance, training and procurement of equipment, with very limited funding for construction of facilities that support the project's core economic growth objective. Broadly, the project targets job creation, enterprise development and community development (Component A), promotion of sustainable tourism marketing and destination management (Component B) and conservation management of the natural resources of Wadi el Gimal National Park¹ (Component C).

The planned LRS physical interventions support the project's goal and objectives. They are therefore integrated into the project's sectoral components, complementing the project's technical assistance, training and procurement activities. The specific physical interventions that will be funded by the LRS project have not yet been finalized. Further site planning is required. However, the types of interventions or "basket", from which the specific site-specific interventions will be drawn has been defined. The physical interventions fit into two categories:

¹ The official name for the park is the Wadi El Gimal-Hamatah National Protectorate. The park is more typically referenced as Wadi el Gimal National Park, with the acronym WGNP. This more typical name is used throughout the PEA.

- Community Infrastructure in targeted Southern Red Sea communities (supporting LRS Component A)
- Basic facilities and park infrastructure in Wadi el Gimal National Park (supporting LRS Component C)

Background on the PEA

The LRS project's physical development activities, which will require the construction of infrastructure facilities, necessitate the completion of an Environmental Assessment (EA), pursuant to USAID's Environmental Procedures (22 CFR 216 or Regulation 216). Based on the nature of the proposed activities and the level of detail currently at hand about these activities, a Programmatic Environmental Assessment (PEA) approach has been adopted for meeting Regulation 216 requirements and developing a process that assures the environmental soundness of project-funded construction activities. The PEA will result in a set of best practices for engineering, environmental management and facilities management for all constructed facilities that will eliminate, or reduce to acceptable levels, any adverse environmental impacts resulting from project-funded activities. These best practices are called mitigation measures.

According to section 216.6(c) of the USAID's environmental procedures (22 CFR 216), programs, projects or activities which are financed by USAID are required to submit an Environmental Assessment (EA). The Environmental Assessment is a detailed study of the reasonably foreseeable environmental impacts, both positive and negative, of a proposed USAID action and its reasonable alternatives. The historical and still dominant approach to conducting an EA under the USAID environmental procedures is to assess the specific proposed interventions at the specific proposed locations for those interventions (along with reasonable alternatives to the proposed interventions and/or proposed locations). This approach is ideal in a situation in which the proposed interventions and proposed locations are well-defined. However, in cases where the project objectives, along with political and institutional realities, require that the project has the flexibility to determine specific interventions and specific locations for these interventions on an ongoing basis, the typical EA approach is less effective.

In such cases, USAID has increasingly employed the PEA approach because a PEA allows for the assessment of a set of proposed interventions within a defined geographic area in which environmental baseline conditions are known and in which the potential impacts of a set of known interventions can be accurately identified. The PEA approach provides the flexibility to conduct the EA work early in the project implementation cycle, while providing the same level of compliance with USAID environmental requirements, and more importantly, the same level of assurance that proposed interventions will be environmentally sound. As described in Section 216.6(d), the PEA approach should, to the extent practicable, follow the same path as a traditional project-specific EA, covering all the steps in the process that are necessary to describe baseline conditions, assess impact and make recommendations to mitigate any potential negative impacts. As such, the PEA will address all of the EA requirements described in Section 216.6(c).

As with the more typical project-specific EA, the PEA will assure that all project-funded interventions are environmentally sound in design, construction and operation by completing an assessment process pursuant to USAID's environmental procedures. The PEA uses a

participatory process involving GOE, community, NGO and private sector stakeholders to assess the potential adverse impacts from the project's planned physical interventions.

USAID's environmental procedures require completion of a scoping process. Often the centerpiece of that process is a large scoping session, involving as many of the project stakeholders as possible. In this case, it was deemed more practical and more useful to replace the traditional scoping session (the one big session) with a series of smaller scoping sessions and focused meetings with the various stakeholders in their relevant locations.

The relevant stakeholders were identified based on a review of the proposed interventions, the legal and institutional framework of the project and the EA requirements under USAID's environmental procedures. In cooperation with project staff and with assistance from the Red Sea Nature Protectorate staff and the Red Sea Governorate, plans were developed to arrange meetings in Cairo and in various locations within the Red Sea Governorate. The scoping approach included meeting representatives of all stakeholders identified in the process and arranging for other necessary activities to achieve the overall aim of the scoping exercise (i.e. field visits). Project review and experience of the team also assisted in the identification of the communities affected by the project and of local nongovernmental organizations (NGOs) with environmental, commercial or other interests in the project.

The scoping methodology combined semi-structured individual interviews and focused group discussions. The semi-structured interviews were conducted with RSG, TDA, EEAA and the Executive Boards of prominent community development associations (CDAs) located in Marsa Alam, Hamatah, and El Shelateen. The focus group discussions were carried out with members of the local communities, including Bedouin groups. These activities were carried out either in official offices or in the specific geographic locations where the interventions are proposed. Meetings and interviews with the locals were carried out using simple and clear language while observing local tribal customs.

The PEA team consolidated and analyzed the information obtained during its scoping meetings to determine the set of significant environmental issues to be assessed during the PEA itself. The team used a basic decision support system to identify the significant issues. The decision support system consists of two sequential phases. In Phase 1, the team compiled the general issues expressed by stakeholders during scoping meetings and judged their significance. In Phase 2, the team recast those general issues into more specific and actionable environmental issues, aligning those issues with each of the general types of interventions planned by the LRS project.

Description of the Affected Environment

The LRS project area is within the Southern Red Sea region – an area of low human population, large geographically size, institutionally complexity and ecologically uniqueness. The center of the project area is Wadi el Gimal National Park, with a limited number of activities planned for areas surrounding the park itself. The entire project area falls geographically within boundaries of the Red Sea Governorate. This section defined the physical, human and institutional environment relevant to the project's planned physical interventions, providing the baseline data or foundation for assessing the environmental issues and their potential impacts.

The project area is generally defined as the area from Ras Toronbi in the north (73 km north of Marsa Alam) to the Egypt-Sudan border in the south, with all of the project area within 10 km of the coastline, except the area within Wadi el Gimal National Park. The core of the project area is the geographic area within and adjacent to Wadi el Gimal National Park (WGNP), including four significant population centers in the Southern Red Sea – Marsa Alam, Abu Ghusun, Hamatah and El Shelateen. Except for Abu Ghusun, all of these population centers are outside the boundaries of the Park, but their populations and their economic activities directly impact the Park. All project activities are located within the southern part of the Red Sea Governorate.

The locations planned for the project's physical interventions comprise a much more targeted and much smaller area. As mentioned at the start of this section, the project's physical interventions focus primarily on WGNP. In addition, physical interventions are planned for the villages of Abu Ghusun (located within the boundaries of WGNP) and Hamatah (located just outside the southern coastal border of WGNP) and within the city of El Shelateen. This more targeted area forms the spatial bounds of the project area.

Description of Proposed Activities

The scope of this PEA is limited to the project's planned physical interventions. All other project activities, including technical assistance, training and equipment procurement has received a categorical exclusion from further consideration under USAID's environmental procedures. The specific physical interventions to be constructed and the specific locations for these interventions are not known at this time. These uncertainties are balanced against the following factors:

- a well-defined set or "basket" of possible interventions from which the actual interventions will be selected
- a well-defined set of general locations in which planned interventions will be implemented
- reliable baseline data on the physical, human and institutional environment in which planned interventions will be implemented

Together the uncertainties and the known factors make a strong case for undertaking a PEA to assure that the LRS project complies with the requirements of USAID's environmental procedures, guarantees the environmental soundness of all physical interventions and provide the project's implementing partners the maximum flexibility to effectively plan and implement project activities. Accordingly, USAID approved completion of a PEA for the project.

The LRS physical interventions fall into two general categories:

- Community Development Infrastructure in targeted Southern Red Sea communities (supporting LRS Component A)
- Park Infrastructure and Basic Facilities in Wadi el Gimal National Park (supporting LRS Component C)

Potential Environmental Impacts

The PEA assesses the potential environmental impacts associated with each type of planned physical intervention to determine which impacts are significant². A table is provided for each planned physical intervention. *Only those impacts linked to a specific planned physical intervention during the scoping process are included in the table for that specific intervention. Those impacts not linked to a specific planned physical intervention are not included in the table for that intervention.* The PEA assesses the impacts in the construction and operational phases for each planned type of physical intervention.

However, given the extreme fragility of the ecosystems in the project area and the paramount necessity not to compromise their integrity because they are the driver for economic growth in the region, the PEA team errs on the side of caution in its assessment of impacts. The team therefore makes of finding of *significant* with respect to impacts that very likely will not present a problem, particularly given that a set of best practices will be implemented to mitigation any potential for negative impacts. Mitigation measures are linked to each impact and to each planned physical intervention.

The PEA team takes special notice of the social and cultural impacts associated with the planned physical interventions. In the case of the LRS project, no major construction activities are planned that would displace large numbers of households. In addition, the LRS project is committed to using a participatory approach to intervention planning that involves community residents in all phases of the development process. However, the potential still exists for the social, cultural and economic livelihoods of residents in targeted communities to be disrupted by planned physical interventions. It is therefore critical that the opinions and the needs of residents are fully considered and integrated into final plans. In particular, relocation of homes, shops and other vital community facilities should be avoided. The experience of USAID, the World Bank and other bilateral and multilateral development agencies has demonstrated that relocation (or resettlement as it is typically termed), often have unintended negative impacts, even when residents voluntarily agree to these changes.

Recommended Mitigation Measures

In this section the PEA team identifies mitigation measures that will eliminate or reduce to acceptable levels any potential negative environmental impacts from planned physical interventions. A table is presented for each planned physical intervention, with mitigation measures proposed for each significant environmental impact. The mitigation measures are best practices in the following areas:

- Planning Best Practices
- Engineering and Construction Best Practices
- Environmental Management Best Practices

² In the parlance of USAID's environmental procedure, it is important to distinguish between significant environmental *issues* identified in the Scoping Statement and significant environmental *impacts* identified during the PEA. Significant issues are those deemed to have the potential to result in environmental impacts. Those impacts are the ones that are carried forward for assessment from the Scoping Statement to the PEA itself to determine whether the impacts are significant.

- Health and Safety Best Practices
- Facilities Management Best Practices
- Community Participation Best Practices
- Education and Information Dissemination Best Practices

Many of the mitigation measures/best practices apply to multiple interventions and are presented as such. That means that the same mitigation measures are sometimes repeated for the different impacts resulting from a given physical intervention. For example, placement of erosion control barriers around a construction site to prevent erosion of soil may be presented as a mitigation measure for (a) sedimentation, (b) surface water turbidity and (c) coral reef damage resulting from increased surface water turbidity. In this case, three different and related impacts are addressed in part by the same mitigation measures.

The PEA team identifies avoiding relocation of homes, shops or other facilities of local importance as a mitigation measure to prevent social, cultural or economic disruptions to targeted communities. As mentioned in Section Five, relocation of critical community infrastructure often has unanticipated negative impacts, even when residents voluntarily agree to it, and the conditions into which they are being moved are objectively an improvement.

Alternative Analysis

An important difference between the methodology for a typical EA and a PEA is the consideration of alternatives. A typical EA is intervention and site specific, meaning the intervention or set of interventions being proposed is known and the preferred site at which the intervention or set of interventions will be implemented is known. The EA report will recommend the alternative that minimizes negative environmental impacts while still accomplishing the project objective.

As such, USAID environmental procedures for conducting an EA incorporate consideration of alternatives to the proposed intervention, including the no action alternative. For an EA that is examining a specific intervention at a specific location, this consideration clearly applies. However, in the case of a PEA, neither the interventions nor the locations have been established. Rather, the PEA established the range of acceptable interventions (e.g. a basket of potential interventions) within a given geographic area (i.e. the spatial boundaries of the project area). The specific interventions and specific locations remain to be determined during project implementation. Therefore, conducting an alternatives analysis for specific interventions in the context of the PEA is not applicable.

The PEA mitigation measures themselves will establish the basis for consideration of alternatives. This process will be an integral part of finalizing the interventions at specific sites. The analysis will include consideration of the no action alternative. In this way, the project team will conduct alternatives analysis on a case-by-case basis. Therefore the project team would consider a range of alternatives, including the no action alternative, in order to determine the “best” alternative, with the “best” alternative being the one that accomplishes the project objective without leading to any significant environmental impacts.

Environmental Management Plan

The team presents an Environmental Management Plan (EMP) that will implement the mitigation measures and monitor the environmental performance of the planned physical interventions to determine the effectiveness of the mitigation measures. The EMP also includes cost estimates for implementation of the monitoring plan and other recommended technical assistance and training. A schedule for EMP implementation also is included.

These best practices provide the project implementers with a toolbox of actions that they can apply to the full range of physical interventions planned under LRS. Because the final mix of physical interventions and specific site locations has not yet been determined by the LRS project staff in consultation with USAID and the project's three GOE partners, the mitigation measures have been structured to provide flexibility as the decision making process moves forward.

The recommended environmental monitoring plan included indicators for all negative environmental impacts deemed *significant* by the PEA team. It is critical that the environmental monitoring plan is implemented. Otherwise, it is not possible to determine whether the recommended mitigation measures effectively eliminate or reduce to acceptable levels any potential negative environmental impacts resulting from LRS physical interventions. The recommended monitoring plan includes a combination of quantitative and qualitative indicators, biophysical and social indicators.

In order to assure that the monitoring program is successful and sustainable of the long term, the PEA team strongly recommends that the LRS project provide training to GOE staff that will be directly responsible for monitoring activities. The appropriate staff includes the RSG Environmental Management Unit (EMU) staff and the RSP rangers.

The primary costs associated with implementation of the EMP are (a) monitoring and (b) the training program associated with monitoring. All other costs associated with the EMP (e.g. implementation of the mitigation measures) will be integrated into the planning, design, construction and operation of the physical interventions themselves.

Section One: Introduction to the LRS Project

The LIFE Red Sea (LRS) project focuses on increasing sustainable economic growth in the Red Sea Governorate by promoting sustainable tourism. The project builds on prior efforts and addresses the key challenges for the sustainable development of the Egyptian Red Sea. Tourism is the main economic activity in the southern Red Sea, based on the area's exceptional natural resources. Environmental degradation, however, has accompanied the rapid growth of tourism in this governorate, particularly in Hurghada. If resource quality continues to decline, tourists will increasingly choose other destinations.

The LRS project is helping ensure the sustainability of present and future uses of the southern Red Sea area's natural and cultural resources in compliance with best practices and conservation management principles. The project works with three Government of Egypt partners, namely: the Egyptian Environmental Affairs Agency (EEAA), the Tourism Development Authority (TDA), and the Red Sea Governorate (RSG). The project's geographic focus is the Southern Red Sea Zone, with terrestrial/desert, coastal and marine sites identified for possible interventions. Project activities include technical assistance, training, procurement of equipment and physical infrastructure development.

1.1 LRS Objectives

The LRS overall goal is to promote sustainable natural and cultural tourism development in the Southern Red Sea region that meets the needs of present tourists and local residents, while protecting and enhancing economic opportunities for the future. The associated objectives are:

- Objective 1: To engage local Red Sea residents equitably in the economic, social and cultural benefits generated by tourism
- Objective 2: To enhance competitiveness of Egypt in the fast growing international natural and cultural tourism market
- Objective 3: To ensure protection, management and sustainable use of the natural and cultural assets upon which the RSG tourism industry and local livelihoods are based

1.2 LRS Project Components

The LRS project has three sectoral components and one project support or cross-cutting component, all focused on supporting economic growth in the Red Sea Governorate. The project focuses primarily on technical assistance, training and procurement of equipment, with very limited funding for construction of facilities that support the project's core economic growth objective. Broadly, the project targets job creation, enterprise development and community development (Component A), promotion of sustainable tourism marketing and destination

management (Component B) and conservation management of the natural resources of Wadi el Gimal National Park³ (Component C).

All of the technical assistance, training, and equipment procurement has been categorically excluded from further consideration under USAID environmental procedures. Those activities that require construction of physical infrastructure are subject to review under USAID environmental procedures. Because the precise type and location of the physical infrastructure planned is not known at this time, the project proposed and USAID approved the completion of a PEA. The PEA will assess the types of physical interventions proposed and develop a set of engineering and facilities management best practices and environmental mitigation measures to eliminate or minimize any negative environmental impacts.

Component A focuses on creating short and long term employment opportunities for residents of the Southern Red Sea governorate. Short term job opportunities will come from employing residents in the construction of infrastructure related to solid waste management interventions, facilities in Wadi el Gimal National Park and the upgrading of informal settlements in the region. Longer term employment will come from identifying economic growth and business development opportunities linked to the burgeoning tourism sector in the region. Component A will involve the construction of physical infrastructure for housing and other community development needs.

Component B activities focus on support for sustainable tourism, with activities targeted at key points in the value chain, and on promotion of sustainable tourism products to key markets. We will work to improve the institutional environment for sustainable tourism development, develop pilot activities/products in selected communities and create SME opportunities for local entrepreneurs. In addition, we will create long term linkages with sustainable tourism tour operators in key European markets. Component B will not involve the construction of any physical infrastructure.

Component C addresses the conservation management activities of the project. Effectively managing the natural and cultural resources that are the foundation for ecotourism development is a critical ingredient in the sustainable economic growth of the SRS. Component C will involve the construction of physical infrastructure in the form of basic facilities within Wadi el Gimal National Park to support tourist visits.

LRS also has a forth component (Component D) that addresses the project's cross-cutting tasks, including communications, environmental education, Geographic Information System (GIS) services and project monitoring and evaluation.

1.3 LRS physical interventions

The planned LRS physical interventions support the project's goal and objectives. They are therefore integrated into the project's sectoral components, complementing the project's

³ The official name for the park is the Wadi El Gemal-Hamatah National Protectorate. The park is more typically referenced as Wadi el Gimal National Park, with the acronym WGNP. This more typical name is used throughout the PEA.

technical assistance, training and procurement activities. The purpose of the planned physical interventions is to:

- Create economic growth and new job opportunities by employing local people in the construction of project-funded infrastructure and by improving the physical infrastructure upon which small enterprises can be built
- Improve living conditions and livelihoods in target communities by improving basic physical infrastructure
- Improve access and amenities for tourists visiting the project area by developing the transport and other infrastructure necessary to support tourist visitation
- Enhance protection of fragile natural resources in the project area by improving the physical infrastructure necessary to effectively manage visitation to ecologically fragile areas

The specific physical interventions that will be funded by the LRS project have not yet been finalized. Further site planning is required. However, the types of interventions or “basket”, from which the specific site-specific interventions will be drawn has been defined. The physical interventions fit into two categories:

- Community Infrastructure in targeted Southern Red Sea communities (supporting LRS Component A)
- Basic facilities and park infrastructure in Wadi el Gimal National Park (supporting LRS Component C)

A complete description of the types of physical interventions planned and their general locations is in *Section Four, Description of Proposed Activities*.

Section Two: Background on the PEA

The LRS project's physical development activities, which will require the construction of infrastructure facilities, necessitate the completion of an Environmental Assessment (EA), pursuant to USAID's Environmental Procedures (22 CFR 216 or Regulation 216). The LRS project received a Positive Threshold Decision requiring completion of an EA in the project Initial Environmental Examination (IEE), which was approved on September 15, 2005. The Based on the nature of the proposed activities and the level of detail currently at hand about these activities, a Programmatic Environmental Assessment (PEA) approach has been adopted for meeting Regulation 216 requirements and developing a process that assures the environmental soundness of project-funded construction activities. PEA is described in Section 216.6(d) of the USAID Environmental Procedures and is appropriate for the assessment of a group of individual actions.

The PEA will result in a set of best practices for engineering, environmental management and facilities management for all constructed facilities that will eliminate, or reduce to acceptable levels, any adverse environmental impacts resulting from project-funded activities. These best practices are called mitigation measures. In addition, the PEA will include an environmental management plan (EMP) to assure that all recommended mitigation measures are implemented and that they are effective. The EMP will include an environmental monitoring plan, which will be integrated with LRS's existing project Monitoring and Evaluation (M&E) Plan, to provide long term environmental monitoring of all project interventions. The EMP also will consolidate recommended training activities, provide a schedule for implementation of the EMP and provide an estimate for the cost of EMP activities. The "toolbox" of best practices that will result from the PEA process will serve as a model on which other projects or agencies may draw when implementing similar physical interventions on other sensitive lands in Egypt.

2.1 Rationale for the PEA approach

According to section 216.6(c) of the USAID's environmental procedures (22 CFR 216), programs, projects or activities which are financed by USAID are required to submit an Environmental Assessment (EA). The Environmental Assessment is a detailed study of the reasonably foreseeable environmental impacts, both positive and negative, of a proposed USAID action and its reasonable alternatives. It includes alternatives which would avoid or minimize adverse effects or enhance the quality of the environment so that the expected benefits of development objectives can be weighed against any adverse impacts upon the human environment or any irreversible commitment of resources.

The historical and still dominant approach to conducting an EA under the USAID environmental procedures is to assess the specific proposed interventions at the specific proposed locations for those interventions (along with reasonable alternatives to the proposed interventions and/or proposed locations). This approach is ideal in a situation in which the proposed interventions and proposed locations are well-defined. However, in cases where the project objectives, along with political and institutional realities, require that the project has the flexibility to determine specific

interventions and specific locations for these interventions on an ongoing basis, the typical EA approach is less effective.

In such cases, USAID has increasingly employed the PEA approach because a PEA allows for the assessment of a set of proposed interventions within a defined geographic area in which environmental baseline conditions are known and in which the potential impacts of a set of known interventions can be accurately identified. The interventions proposed by the LRS project meet the criteria for a PEA because a set or “basket” of possible interventions has been defined and the general locations for these interventions have been determined. However, given the institutional challenges required to make final decisions regarding each specific intervention and each specific location (e.g. obtaining consensus among up to three GOE partners, communities residents and a range of other stakeholders), it is not practical to conduct a stand alone EA for either each intervention as it is finalized or for all interventions after all have been finalized. Either of these alternatives would delay project implementation beyond the point of project viability.

The PEA approach provides the flexibility to conduct the EA work early in the project implementation cycle, while providing the same level of compliance with USAID environmental requirements, and more importantly, the same level of assurance that proposed interventions will be environmentally sound. As described in Section 216.6(d), the PEA approach should, to the extent practicable, follow the same path as a traditional project-specific EA, covering all the steps in the process that are necessary to describe baseline conditions, assess impact and make recommendations to mitigate any potential negative impacts. As such, the PEA will address all of the EA requirements described in Section 216.6(c). The PEA is subject to USAID review and approval under the general procedures (22 CFR 216).

2.2 Purpose of the PEA

As with the more typical project-specific EA, the PEA will assure that all project-funded interventions are environmentally sound in design, construction and operation by completing an assessment process pursuant to USAID’s environmental procedures. The PEA uses a participatory process involving GOE, community, NGO and private sector stakeholders to assess the potential adverse impacts from the project’s planned physical interventions. The PEA will result in a set of engineering and environmental management best practices for design, construction and operation of all physical interventions. These best practices or BPs will serve as the PEA mitigation measures, addressing all potential negative environmental impacts of proposed interventions. In addition, the PEA will include an environmental monitoring plan that will be integrated with the LRS’s existing project Monitoring and Evaluation Plan, to provide long term environmental monitoring of all project interventions. The “toolbox” of best practices and mitigation measures will serve as a model for similar physical interventions on other sensitive lands in Egypt.

2.3 Description of the Scoping Process

USAID's environmental procedures require completion of a scoping process. Often the centerpiece of that process is a large scoping session, involving as many of the project stakeholders as possible. In this case, it was deemed more practical and more useful to replace the traditional scoping session (the one big session) with a series of smaller scoping sessions and focused meetings with the various stakeholders in their relevant locations. The rationale for this approach was based on the following considerations:

- The project geographic area is relatively large and sparsely inhabited. It therefore was not practical to bring together important stakeholders in one location, particularly nomadic Bedouins whose input to the scoping process was critical
- Organizing a meeting that brings together all the necessary GOE representatives is extremely difficult, given their conflicting schedules and their different locations (i.e. EEAA and TDA based in Cairo, RSG based in Hurghada)
- Many of the key stakeholders, particularly the Bedouins, would likely not attend a formal scoping session with high government officials present. And to the extent any of them would have attended, they very likely would not have felt comfortable expressing freely their opinions.

Using this approach allowed the team to target their presentation of the project and their questions to the specific group with whom they were meeting. The team worked with the LRS project staff and representatives of each of the three GOE partners to insure that they identified and met with all relevant project stakeholders. The PEA team is completely satisfied with the results of this process, having had enthusiastic and thoughtful discussion and comments from stakeholders during their various meetings.

2.31 Stakeholder Identification

Prior to the start up of scoping activities, several coordination meetings were held in the project's Cairo office in order to review the scope of work and carry out a preliminary "stakeholders" identification exercise. Based on these meetings key stakeholders were identified and a program for scoping activities was developed. This program included plans for individual meetings with concerned government agencies as well as focus-group discussions to which representatives from local government agencies were invited.

The relevant stakeholders were identified based on a review of the proposed interventions, the legal and institutional framework of the project and the EA requirements under USAID's environmental procedures. In cooperation with project staff and with assistance from the Red Sea Nature Protectorate staff and the Red Sea Governorate, plans were developed to arrange meetings in Cairo and in various locations within the Red Sea Governorate. The scoping approach included meeting representatives of all stakeholders identified in the process and arranging for other necessary activities to achieve the overall aim of the scoping exercise (i.e. field visits).

Project review and experience of the team also assisted in the identification of the communities affected by the project and of local nongovernmental organizations (NGOs) with environmental, commercial or other interests in the project. The project stakeholders and their interests in the project is given in Table 2.1.

Table 2.1: Stakeholders and their Relevant Role/Interest in the Project

Stakeholders	Role/ Interest
Egyptian Environmental Affairs Agency (EEAA): <ul style="list-style-type: none"> - EIA Department - Nature Protection Department - Regional Branch Office, Red Sea 	Overall coordinating body for regulating, monitoring, and enforcement of developments through setting the EIA system, managing the protection and preservation of natural environment and coordination with concerned and responsible authorities. Information sources.
Tourism Development Authority (TDA)	Managing the land owned by the TDA, and ensuring the execution of environmentally sound tourism developments.
Red Sea Governorate	Legal/administrative role on the local level, local planning, development and environmental role.
Environmental Management Unit, Governorate	Environmental arm of the governorate.
Heads of Red Sea City Councils	Represent the views of the government and communities on the local level.
NGOs and representatives of the public (city/local council members)	Represent the views of the community and their needs, safeguard the environment and influence decision making, carry out community development activities.
Local residents (nomads, fishermen, employers, mine workers, women, etc)	Main beneficiaries of the project and may be affected by its activities.
Scientific community	Research in related topics and influence decision making through public channels. Information sources.
Safari Operators	Knowledge of the project area and potential user of local workforce.
Tourist hotels	Knowledge of the project area and experience with local community, and potential user of local workforce

The stakeholder identification process outlined above was among the first tasks of the scoping process. Understanding the potential interests of these groups not only assisted in the stakeholder identification process, but also assisted in determining the structure and content of the meetings to be held. Understanding the views, interests and knowledge base of the local communities is also very important for determining the specific interventions and specific locations for those interventions, thus maximizing the project's positive benefit to the community.

2.32 Scoping Methodology

The scoping methodology combined semi-structured individual interviews and focused group discussions. The semi-structured interviews were conducted with RSG, TDA, EEAA and the Executive Boards of prominent community development associations (CDAs) located in Marsa Alam, Hamatah, and El Shelateen. The focus group discussions were carried out with members of the local communities, including Bedouin groups. These activities were carried out either in official offices or in the specific geographic locations where the interventions are proposed. Meetings and interviews with the locals were carried out using simple and clear language while observing local tribal customs.

The PEA team sought the views and concerns of the local communities during a field trip to the project area that was carried out 16-22 August 2005. During this field mission the team explored the general environmental settings of the sites where potential project interventions are planned, documenting and photographing key features. During this field visit the team visited all project locations and conducted meetings with all stakeholders. The PEA team met with TDA and the Central Department for Environmental Impact Assessment/EEAA officials in their respective offices in Cairo.

The PEA team consolidated and analyzed the information obtained during its scoping meetings to determine the set of significant environmental issues to be assessed during the PEA itself. The team used a basic decision support system to identify the significant issues. The decision support system consists of two sequential phases. In Phase 1, the team compiled the general issues expressed by stakeholders during scoping meetings and judged their significance. In Phase 2, the team recast those general issues into more specific and actionable environmental issues, aligning those issues with each of the general types of interventions planned by the LRS project. The decision support system relies on four sequential tables that advance the process from the raw data obtained from the stakeholders to a final set of significant environmental *issues* linked to potential environmental *impacts* and aligned with each type of planned physical intervention.

Section Three: Description of the Affected Environment

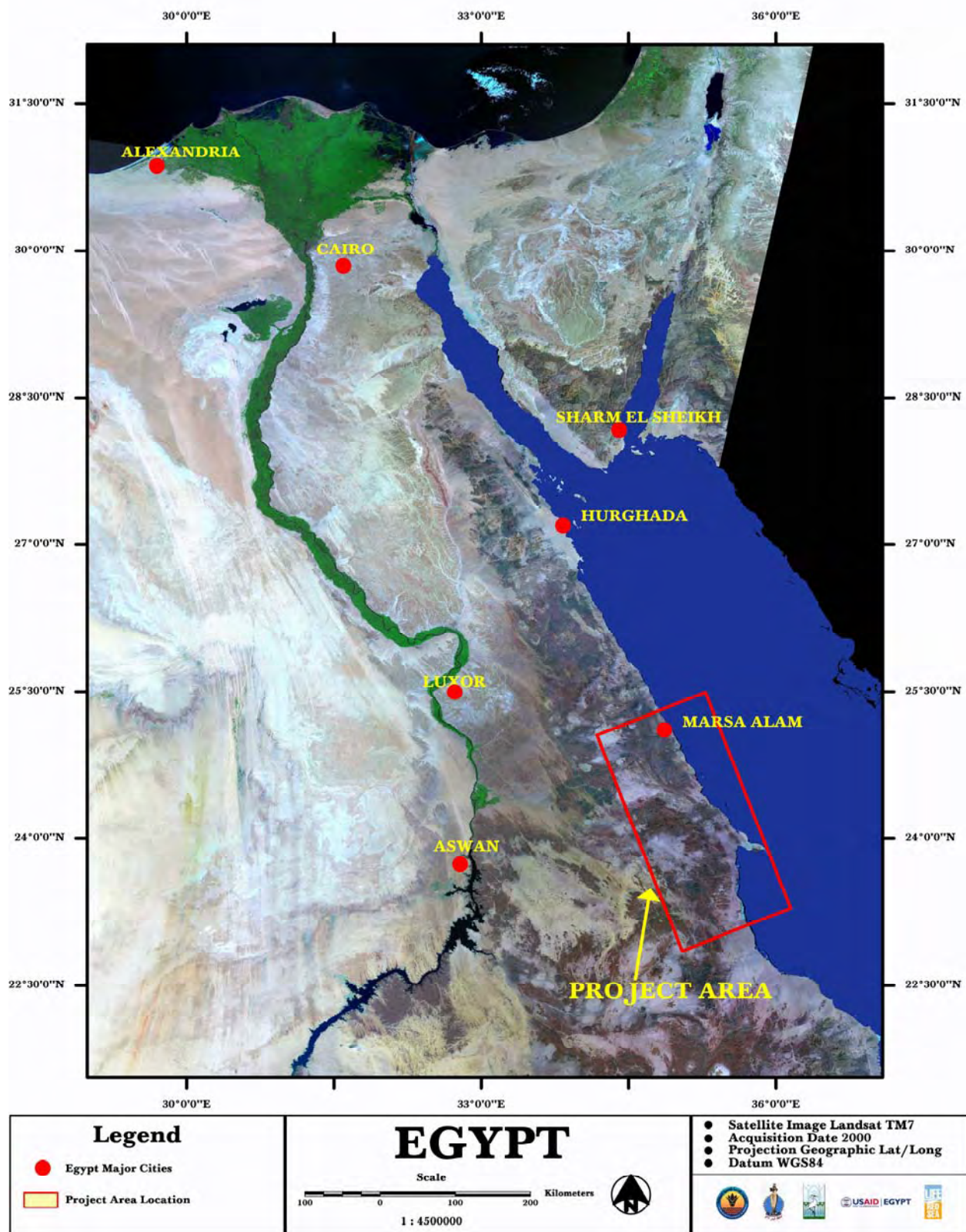
The LRS project area is within the Southern Red Sea region – an area of low human population, large geographically size, institutionally complexity and ecologically uniqueness. The center of the project area is Wadi el Gimal National Park, with a limited number of activities planned for areas surrounding the park itself. The entire project area falls geographically within the boundaries of the Red Sea Governorate. This section defined the physical, human and institutional environment relevant to the project's planned physical interventions, providing the baseline data or foundation for assessing the environmental issues and their potential impacts.

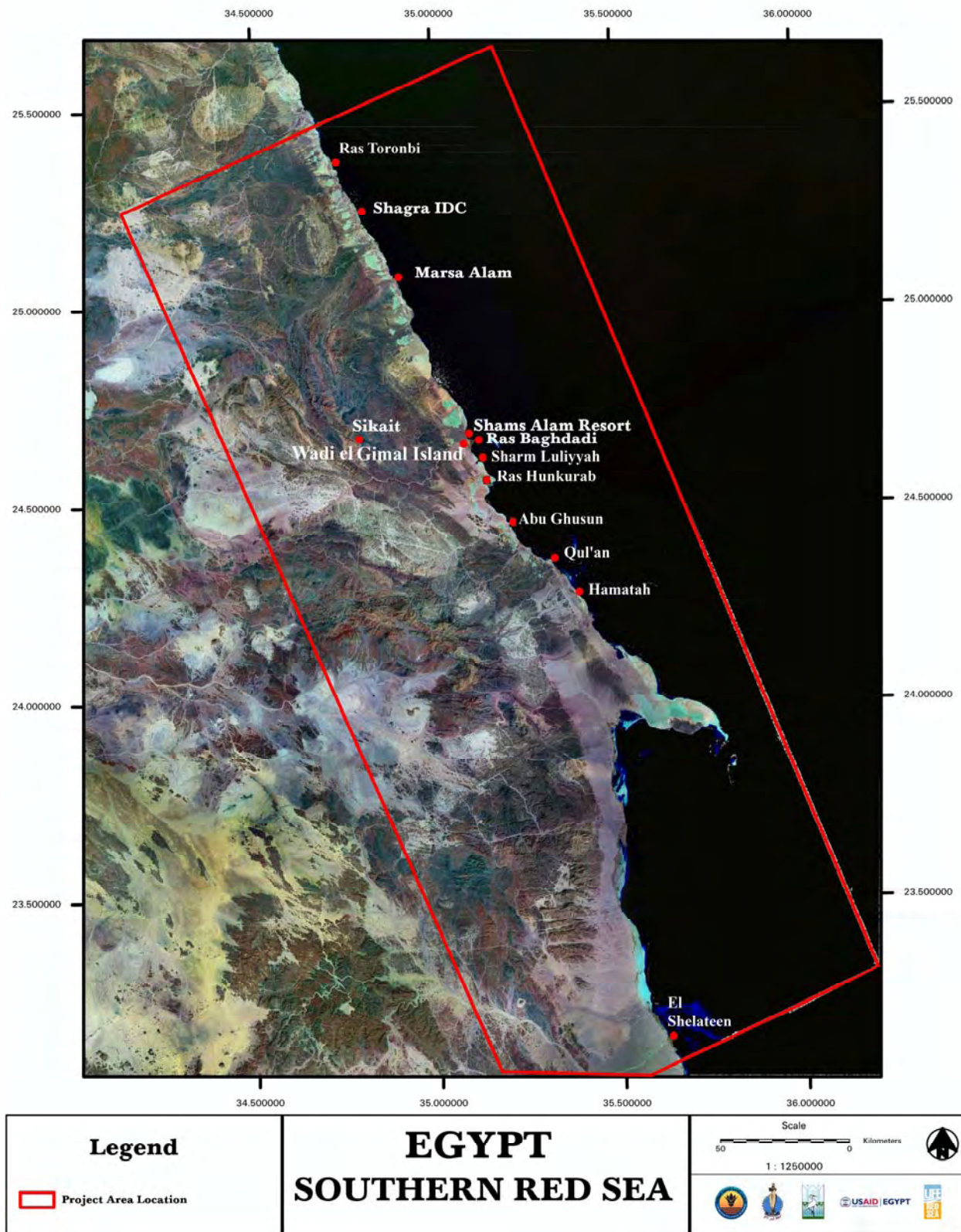
3.1 Physical Environment

3.11 Geographic Scope of the Proposed Activities

The project area is generally defined as the area from Ras Toronbi in the north (73 km north of Marsa Alam) to the Egypt-Sudan border in the south, with all of the project area within 10 km of the coastline, except the area within Wadi el Gimal National Park. The core of the project area is the geographic area within and adjacent to Wadi el Gimal National Park (WGNP), including four significant population centers in the Southern Red Sea – Marsa Alam, Abu Ghusun, Hamatah and El Shelateen. Except for Abu Ghusun. All of these population centers are outside the boundaries of the Park, but their populations and their economic activities directly impact the Park. All project activities are located within the southern part of the Red Sea Governorate. The maps on the following three pages orient the reader to the location of the project area.

The locations planned for the project's physical interventions comprise a much more targeted and much smaller area. As mentioned at the start of this section, the project's physical interventions focus primarily on WGNP. In addition, physical interventions are planned for the villages of Abu Ghusun (located within the boundaries of WGNP) and Hamatah (located just outside the southern coastal border of WGNP) and within the city of El Shelateen. This more targeted area forms the spatial bounds of the project area.





3.12 Baseline Environmental Conditions

Physical Features – Geology

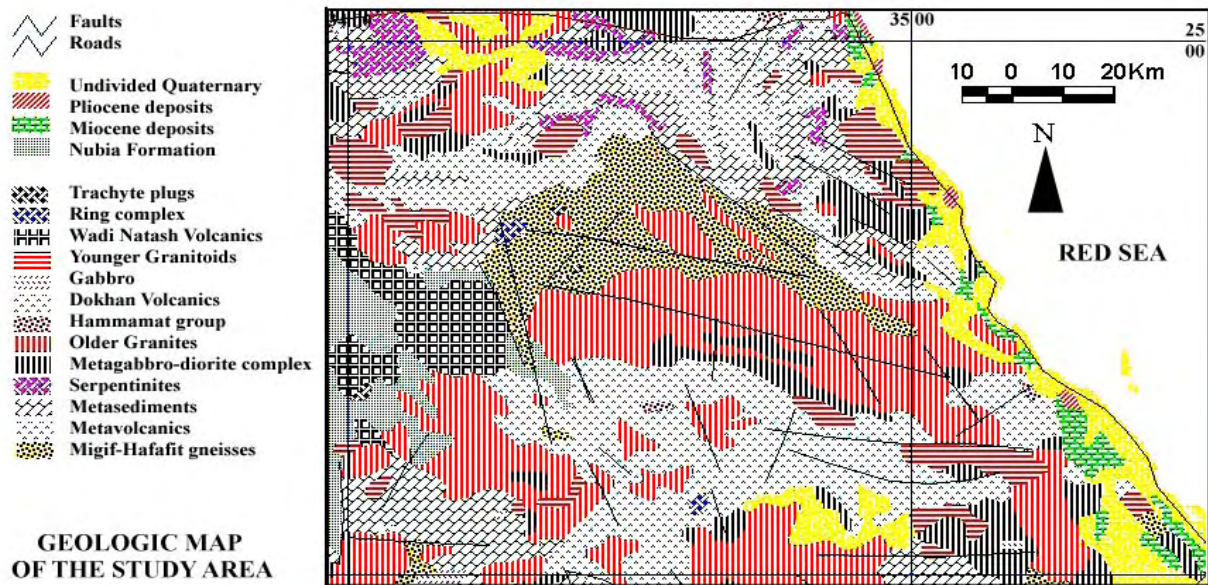


Figure 3.1 Geological and structural map of the area

The project area is part of the Eastern Desert of Egypt, covered mainly by Pre-Cambrian igneous and metamorphic rocks with a thin blanket of Phanerozoic sedimentary rocks. Basement rocks are mainly Pre-cambrian, represented mainly by Hafait gneisses, meta-volcano-sedimentary rocks, ophiolitic melang group, granitic rocks with some small outcrops of Hammamat sediments, and Dokhan volcanics. Dyke swarms, quartz veins and different types of veins are also present as shown in Figure 3.2. More basement rocks have been intruded during the Cretaceous time, known as ring complexes.

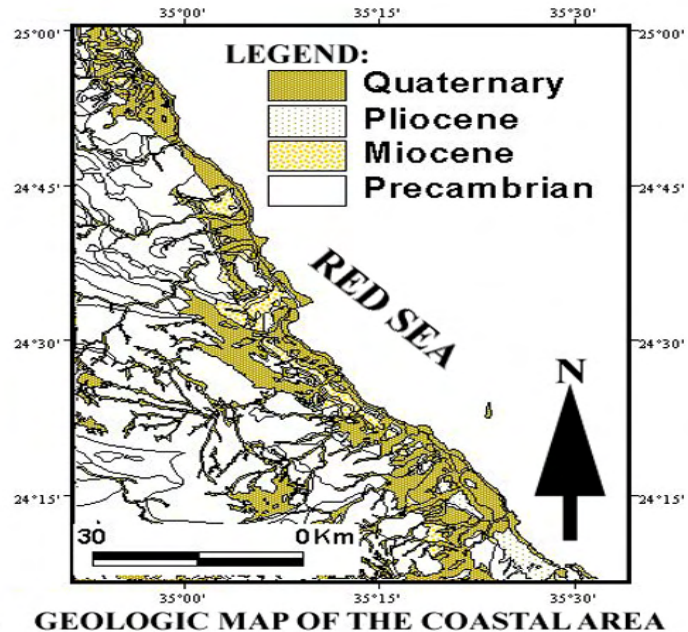


Figure 3.2: Basic geology of the project area

Along the Red Sea coastal plain the sedimentary rocks belonging to the Tertiary and Quaternary periods cover most of the basement complex. The Tertiary rocks consist of Paleocene chalk, Eocene limestone, Oligocene clastics, Miocene sediments, and Pliocene marine beds. The Quaternary deposits are represented by undivided Quaternary wadi deposits, sabkha and playa deposits as shown in Figure 3.

Pre-Cambrian igneous and metamorphic rocks

Rock units:

- Migif – Hafafit gneiss
- Metavolcano sedimentary rocks
- Ophiolitic mélangé
- Granodiorite rocks
- Hammamat sediments
- Late-collision granites
- Dykes swarms
- Quartz Veins
- Phanerozoic rocks

Sediments:

- Miocene sediments
- Pliocene sediments
- Pleistocene sediments
- Quaternary Deposits

Physical Features – Geomorphology

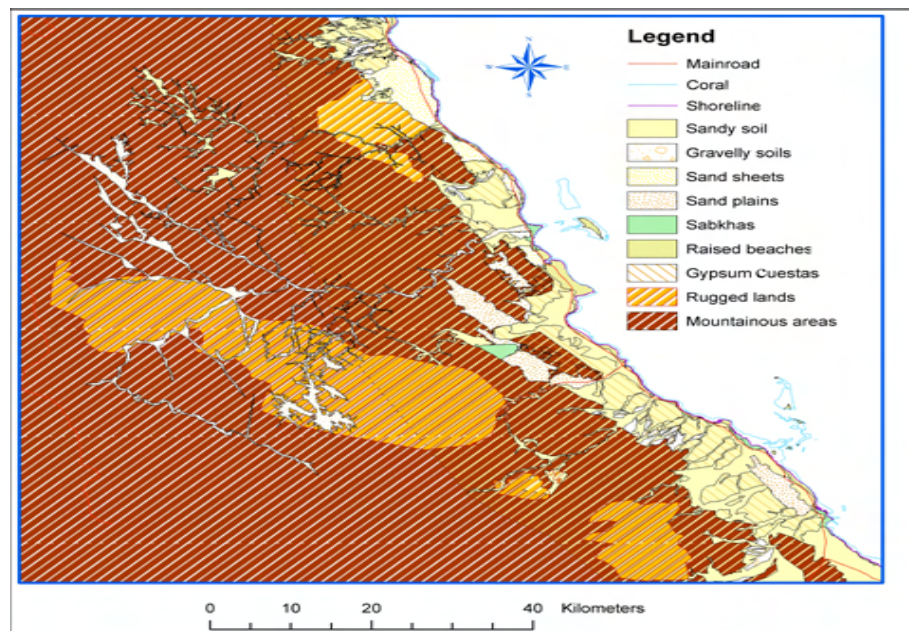


Figure 3.3: Geomorphological map of the area.

located in the southern part of the area while Gabal Nogrur (1,509 meters a.s.l.) lies in the northern part. Medium relief peaks are represented by Gabal Omul-Abas (690 meters a.s.l.),

The area is rich with geomorphological features.

Topographically, the area includes very high relief mountains such as Gabal Samak Mulak (1,976 meters a.s.l.), Gabal Hamatah (1,762 meters a.s.l.), Gabal El-Khashyyir (1,562 meters a.s.l.) and Gabal Abu Arqub (1,608 meters a.s.l.). All the high relief mountains are

Gabal El-Mukhatatah (570 meters a.s.l.), Gabal Hafafit (879 meters a.s.l.). Eastwards, the relief becomes lower, passing into low hills, sedimentary cuestas, tablelands and plains.

Geomorphological units

The area is classified into nine geomorphologic units as shown in Figure 3.3. Geomorphological units that can be discussed and mapped in the area are many. These geomorphological features are:

Mountainous areas in which the Red Sea Mountains represent the backbone of the whole territory.

Rugged lands: in which the granitic rocks reflect low separated hills with wide low areas in between.

Cuestas of sedimentary rocks: cuesta is a common expression of tilted sequence which varies in resistance to weathering according to its different lithology. It has an abrupt cuesta scarp in the up-dip side and a more gentle dip slope extending in the direction of the regional dip.

The terraces at the entrance of the wadis are formed of recent sediments, mainly of boulder of variable sizes. These terraces are suitable for any buildings in the back area away from flooding hazards.

Sand sheets are very wide, gently slopped, sand beaches like that opposite to Wadi Durri.

Sand plains are areas that are sand-covered at the back but not sandy directly along the beach, such as Aledindibat sand plain between Wadi Abu Ghusun and Wadi el Gimal (Gemal)

Sand and gravel soils represent the soils at the entrance of the wadis and along the wadi floor. It may be gravelly, sandy or silty soil.

Sabkhas and salt marshes that are mostly along the coastal plane as a result of the salinity of sea water and nearness of evaporation in the area.

The raised beaches which bound the Red Sea and protect it from water wave erosion. They are formed mainly of old dead coral reefs. The beaches also show meandering, forming a set of bays, sharms and heads. Some islands formed mainly of reefal shoulder are present in the area.

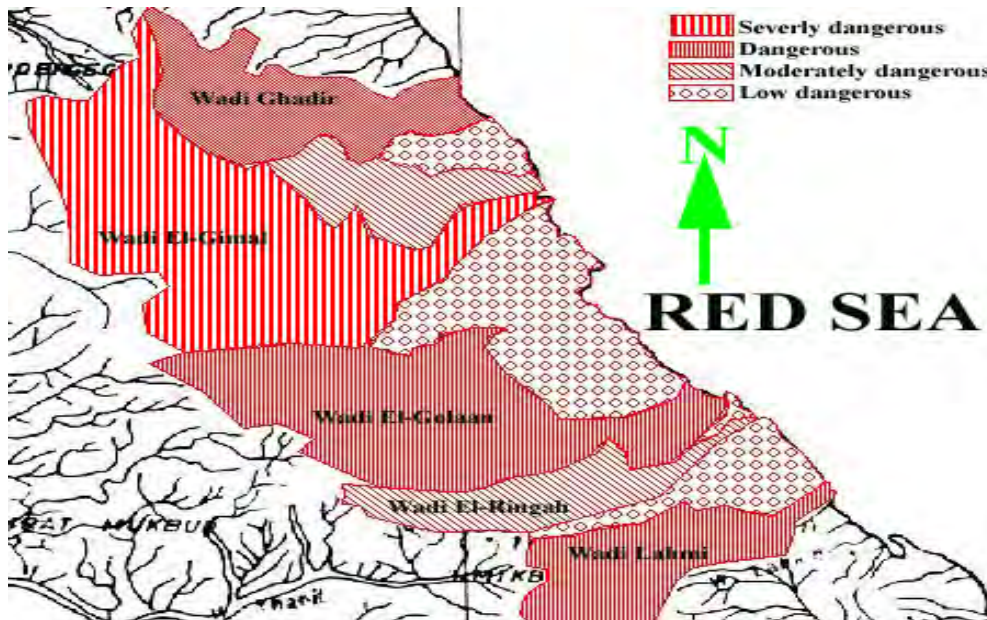
Sand accumulation in Wadi Luliyyah, which is a very exciting phenomenon as it is formed in a narrow wadi representing the effects of the winds that have come from the southeast and lost their ability to carry sand as a result of hitting the mountains bordering this narrow valley.

Physical Features – Surface Hydrology

Drainage systems

The area has been cut by many major wadis of which Wadi El, Wadi Ghadir, Wadi Omul Abas, Wadi Renga, Wadi al-Qul'an, Wadi Abu Ghusun and Wadi Lahmy are the most important.

These wadis show very steep slopes in the area of the Red Sea mountains with no vegetation cover and the rocks are generally impermeable, causing heavy runoff of flooded water in the



upstream areas. In the downstream area, the sedimentary rocks of reasonable permeability and the valleys are wide and flat causing the run-off to be reduced. The drainage basins from these watersheds and their impacts in the area are presented in Figure 3.4.

Figure 3.4: Watersheds (drainage basins)

Ecological Features

Four main ecological zones were identified for a typical watershed within the project area as shown in Figure 3.5. These four zones are distinguished by the ways in which the biotic and abiotic components of the environment interact to generate landscape heterogeneity. A brief description of the four zones and their representative biodiversity is provided hereunder.

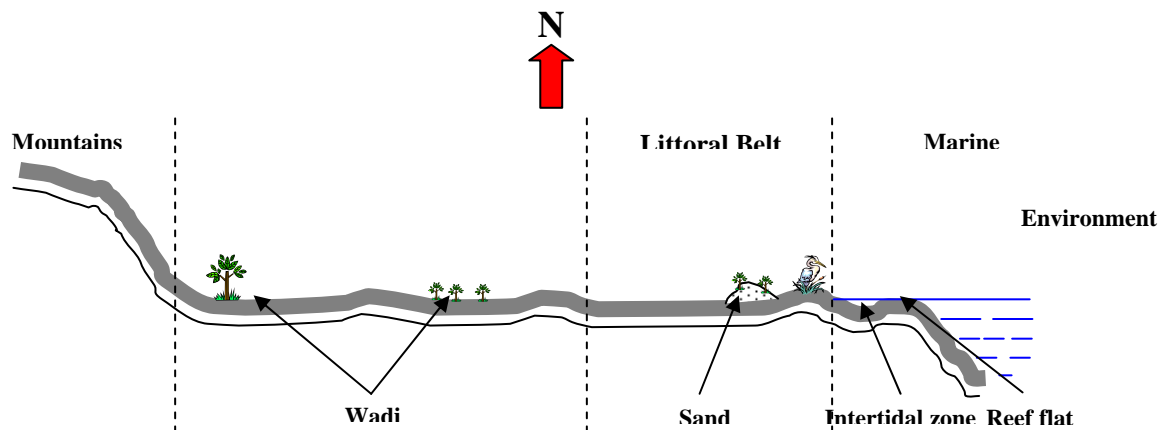


Figure 3.5: Schematic representation of the ecological zones of the project area

Ecological Features – Zone 1: Mountains and Wadis

In the Eastern Desert, mountains of igneous or metamorphic rocks rise gradually from west to east. An extensive system of wadis dissects these mountains. Wadis flowing from the mountains to the Red Sea are relatively short, steep and more numerous compared with those draining westwards into the Nile Valley. Wadis may extend from the foothills to the coastal front or may not reach the coast. The downstream extremities of the main wadis may form deltaic basins. Superimposed on this pattern, aeolian deposits may form sheets, mounds or hills of various size and extent. This complex set-up produces a likewise complex set up of habitat conditions. Within the desert plain ecosystem, the soil transporting agencies (water and wind) are actively operating.

The dominant vegetative species of the wadi is the Acacia tree. There are five species of Acacia trees found within the SRS and three of these species occur in the project area. The most common of these Acacia species is *Acacia tortilis* as shown in Figure 3.6, followed by *A. raddiana*. Acacia trees are large, drought-resistant trees that play a vital role in the ecosystems of the wadis. They provide food and shade for several domestic and wild animals. Their wood is used by locals for construction and as a source of charcoal while the pods and bark are used for tanning and the flowers are used in the manufacture of cosmetics. Other common trees include *Balanites aegyptiaca* and *Tamarix aphylla* (Khedr, 2003).

Mountain dwelling animals include the very rare Nubian ibex, *Capra ibex nubiana* and the Rock Hyrax, *Procavia capensis*. The elusive Dorcas Gazelle (*Gazella dorcas*) is frequently seen running through the mountains in order to elude danger and migrate between wadis. All of these mammals are threatened and are now designated as protected species. The very rare Wild Ass (*Equus africanus*), also inhabits WGNP.

Ecological Features – Zone 2: Coastal Plain

The coastal plain is non-saline as it lies above sea level and far from the reach of the tidal water. It is essentially a gravel-covered plain traversed by the main wadis and their tributaries.

Nine plant species were recorded by Khedr (2003) in the coastal desert plain. The dominant species are *Zilla spinosa*, *Zygophyllum coccineum* and *Tamarix aphylla*,



Figure 3.6: *Acacia tortilis* in Wadi Abu Ghosun



Figure 3.7: *Tamarix aphylla* growing in a sandy habitat of the wadi bed



Figure 3.8: The Sooty Falcon (*Falco concolor*)

shown in Figure 3.7. The Wadi el Gimal coastal area is a unique refuge for scarce botanical species. For example, the wadi delta has the only Dome Palm tree (*Hyphaene thebaica*) left on the shore of the entire Red Sea coast. Besides, a palm grove resembling an oasis is formed by the Date Palm *Phoenix dactylifera* (TDA/RSSTI, 2003; TDA,n.d.). Also, few medicinal plants are growing in this habitat such as *Anastatica heirochuntica* and *Cleome droserifolia*.

The coastal plain habitat is inhabited by a large number of reptilian species with lizards forming the largest group. Besides, different resident species of birds have been recorded at the Red Sea coastal plains, including several protected falcons such as *Falco concolor* as shown in Figure 3.8, *F. biarmicus* and *F. pelegrinoides* (EEAA/UNEP, 1993; Basuouny, 2003).

Ecological Features – Zone 3: Littoral belt

The littoral belt comprises the coastal salt marshes and other associated habitat types as well as human settlements. The marshes comprise areas of land bordering the sea and are subject to periodic inundation by high tides. They have certain qualities related to the proximity of the sea that distinguish them from inland salt marshes (Chapman, 1974 and Zahran, 1977 in EEAA/UNEP, 1993).

Littoral salt marshes may be conceived as the seaward fringes of inland desert; their landward border is set by the desert conditions. Vegetation of the salt marsh ecosystem generally occurs in zones parallel to the shoreline.

Fifteen plant species were recorded in the project area, generally halophytes, sometimes mixed with xerophytes. The dominant species are *Arthrocnemum macrostachyum*, *Zygophyllum album*, *Tamarix nilotica* and *Limonium axillare*. Also, the rare halophytic species *Atriplex farinosa* and *Aeluropus massunesis* are recorded on the shores of the project area (Khedr 2003) in the brackish water of Wadi el Gimal delta as shown in Figure 3.10. Also, the rare halophytic species *Atriplex farinosa* and *Aeluropus massunesis* are recorded on the shores of the project area.

A distinction may be noted between the salt marsh ground and the sand bodies overlying it. Salt marsh ground is usually formed by the accumulation of tidal mud or by land exposed by the subsidence of the sea. Sand mounds shown



Figure 3.9: Brackish water lagoon in Wadi El- dominated by *Ruppia maritima*, *Phragmites australis* and *Juncus rigidus*



Figure 3.10: *Tamarix nilotica* forming phytogenic mounds



Figure 3. 11: Camels browsing on *Avicennia marina*

in Figure 3.11 are usually covered by *Zygophyllum album*; higher sandy hillocks by *Suaeda monoica* and *Nitraria retusa*.

Mangroves

Mangroves are found scattered along the Red Sea coast within the project area as shown in Figure 3.11. Their usual habitat is shallow water in protected areas such as lagoons, bays, coral or sand bars parallel to the shore. Within the Red Sea coast, mangrove vegetation is usually dominated by *Avicennia marina* (EEAA/UNEP, 1993; GEF, 1997). *A. marina* is recorded as the dominant growth pattern in the project area at Ras Baghdadi, Al Qul'an and Wadi Lahmy.

The coastal habitats support by far the largest bird population in the area, although the number of species is smaller in comparison to other habitats in the area (Basuouny, 2003). Most of these species are closely related to mangrove trees which provide suitable roosting, perching, nest building materials and feeding places. Cormorants, herons, falcons waders, gulls, terns, kingfishers and many migratory passerines are frequently seen at mangroves and reef areas. Characteristic species include the Striated Heron, *Ardeola gularis*, the Western Reef Heron *Egretta gularis* (Figure 3.12), the Spoonbill, shown in Figure 3.13, *Platalea leucorodia*, the Osprey *Pandion haliaetus* and the Caspian Tern *Sterna caspia* that was found nesting on the mangrove trees in both Hamatah and Al-Qul'an as well as in Wadi El Gimal and Shwarit Islands.



Figure 3.12: Reef Heron
(*Egretta gularis*)

Ecological Features – Zone 4: Marine Environment

Fringing Reef

A large fringing reef extends along the coast of the southern Red Sea Region. From Marsa Alam to Sudan, the reef shelf is very wide extending in some places up to 500 meters with varying slopes. The reef generally protects the coastal area and experiences very little water movement, except when occasional swells from the west or north occur. The coral patches on this reef are 100 percent alive and with high species diversity. The number of coral species ranges from 23 to 35 species per site.



Figure 3.13: Common Spoonbill
(*Platalea leucorodia*)

Although it is the “hard coral” framework which builds the reef foundation, there are many plants and animals which live in, on or among this framework. Coral reefs are considered most significant when considered as highly integrated ecosystems, including hard and soft corals, seaweeds, snails, slugs, crabs, shrimps, fishes, etc. The sea floor between Wadi el Gimal Island and the shore consists of coarse sand interrupted in many areas with sea grass beds and coral patches.

Coral reefs of the Red Sea support approximately 400 fish species that utilize corals for shelter, food or as a breeding ground. Many of the reef fishes are of economic as well as recreational importance. 28 open water species are fished commercially from the area with groupers representing the most abundant species. Large snappers and pelagic species such as jacks and mackerel can also be expected to be found on the outer rim of the reefs.

Offshore Marine Environment

The offshore marine environment is a zone that begins at the most offshore perimeter of the fringing reef systems and extends seaward to the limit of Egypt's jurisdiction. This zone constitutes another mosaic of endemic marine life within the coral patches and submerged reefs occurring between the shore and the islands. These submerged reefs present a hazard to any boat traffic circumnavigating the islands.

Based on marine surveys conducted by government agencies and scientific research organizations, the following fish species are known to inhabit the offshore marine waters in the vicinity of the Protectorate Area: Groupers (Serranidae), Snappers (Lutjanidae), Emperors (Lethrinidae), Goatfish (Mullinidae), Wrasses (Labridae), Parrotfish (Scaridae), Surgeonfish (Acanthuridae), Rabbitfish (Siganidae), Damselfish (Pomacentridae), Angelfish (Pomocanthidae), Anthias (Anthiidae), Butterfly (Chaetodontidae) and Fusilier (Caesionidae).

Offshore islands

The project area encompasses 22 islands off the coast of the Egypt such as Wadi el Gimal Island. The mangrove stands on the islands, although small, are considered one of the most critical habitats throughout the coast. The presence of mangroves on Wadi el Gimal Island makes it a perfect habitat for hundreds of island coastal birds, shorebirds and seabirds.

Wadi el Gimal Island is formed mainly of uplifted coral, about 5-10 meters above sea level, and the western side has a long sandy beach. Mangrove trees grow in the southeastern corner of the island in a pocket of old reef. A large number of coral patches are located at the eastern side, while the western side faces a navigation channel and is rockier, with fringed coral. A large area of submerged reef is located slightly to the north of the island. The island supports globally significant bird species and it has been classified as an "Important Bird Area" by BirdLife International (Baha El Din, 1999).

In addition to the bird populations, two species of turtles, the Green Turtle (*Chelonia mydas*) and the Hawksbill Turtle (*Eretmochelys imbricata*) use the island as nesting grounds and dolphins are commonly seen swimming around the island. Almost all of the common species of reef fish are found along the entire reef areas around the island.

Summary of Critical Habitats

The environmental quality and integrity of the SRS is perhaps best understood in terms of the ability of its plants and animals to thrive. The critical vegetative zones, mangroves, fringing reef systems, and critical bird nesting offshore islands are all sensitive habitats of higher concern. They support several locally and/or globally endangered species which are rapidly declining, mainly as a result of uncontrolled hunting and/or destruction of their natural habitat. The extent to which the SRS's environment can be sustained will depend upon the preservation of these critical habitats. Figure 14 shows the main sensitivities of the project area.

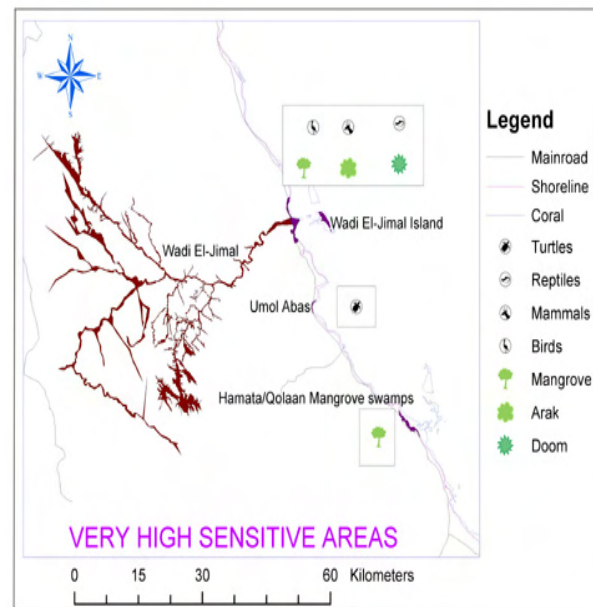


Figure 3.14: Area Sensitivities

3.2 Institutional Environment

The LRS project's three GOE partners, EEAA, RSG and TDA, are the three principle governmental entities with jurisdictional authority over land and resources within the project area. In most cases, the lines of jurisdictional authority are relatively clear. However, some legal uncertainty exists in cases where geographic or operational jurisdiction overlaps. These uncertainties are mentioned wherever relevant. In addition, other GOE entities, such as the Egyptian Army, the Egyptian Coast Guard and the Shore Protection Authority, have authorities in certain circumstances, but these additional authorities are limited in scope, likely not to significantly affect planned LRS physical interventions and are not discussed in the PEA.

3.21 Egyptian Environmental Affairs Agency

EEAA's Red Sea Protectorate (RSP) has authority to manage Wadi el Gimal National Park. In general terms, the RSP manages the Park's natural resources, enforcing laws and decrees regarding the conservation of the Park's flora, fauna and physical assets. The RSP maintains a presence in the Park, its rangers patrolling the Park's terrestrial and marine extent to monitor visitors and the Park's flora and fauna. The RSP's institutional capacity has improved steadily since the Park's establishment in 2003, but is still limited by the number of rangers on staff, and by operational, training and equipment funds. Despite these institutional constraints, the RSP is making progress toward effective management of the park.

3.22 Red Sea Governorate

The RSG is the administrative authority for the municipal entities within its borders. Municipalities within the project area include Marsa Alam, Abu Ghusun, Hamatah and El Shelateen. Brief descriptions of these municipalities are provided in Section 3.3, Human Environment. While other municipalities are located within the RSG, they are not within the project area. The RSG also has authority to manage certain near shore marine resources within the governorate and outside the boundaries of WGNP (e.g. the samaadi or dolphin house reef south of the city of Marsa Alam).

3.23 Tourism Development Authority

TDA has administrative authority for all land within five kilometers of the coastline of the Red Sea that is not within the boundaries of any RSG municipalities and not within the boundaries of WGNP. It must be noted that there is some legal ambiguity regarding whether TDA has any jurisdiction for land within WGNP. That issue remains unresolved. TDA's general role is to sell to investors land that it controls so that those investors build resorts and other tourism sector facilities that contribute to Egypt's economic growth. The preferred development model for TDA's activities along the Red Sea coast has been establishment of Integrated Development Corporations (IDCs). These IDCs are essentially self-sufficient resort communities, with multiple hotels and other tourist amenities such as golf courses. Each IDC provides its own basic services, including electricity, water supply, sewerage and security. There are no IDCs operating within the project area.

3.3 Legal Framework

3.31 Egyptian National Legal and Administrative Framework

Egyptian environmental legislation, regulations and guidelines are of direct or indirect relevance to the project. The PEA itself will not be affected by the Egyptian EIA procedures. However, a short summary of the Egyptian legal framework relevant to conduct of environmental assessment is illustrative as to the state of environmental protection that currently exists.

Egypt has a reasonably well-established environmental impact assessment (EIA) procedure, established in the mid-1990s. While its application is inconsistent, the Egyptian EIA procedure does provide a foundation for impact assessment of physical interventions. EIA application also has created a cadre of EIA practitioners in Egypt familiar with the EIA conceptual framework. The PEA, therefore, has been completed in an institutional environment familiar with and accepting of EIA and using Egyptian specialists with substantial EIA experience.

The proposed project falls under the administrative/legal jurisdiction of both USAID (the funding agency) and the Government of Egypt (the host country). The PEA responds to the requirements of the USAID environmental procedures. A separate EIA will be conducted to satisfy Egyptian legislative and regulatory requirements. The two assessments are discrete. However, much of the same baseline data, impact analysis and response mechanisms (e.g. mitigation measures) will be used for both procedures. Because the PEA will be conducted prior

to the EIA, it will in many ways lay the groundwork for the subsequent completion of the Egyptian EIA procedure.

Law 4/1994 (Law of the Environment)

According to Law 4/1994, Law of the Environment, and its Executive Regulations (ERs), the project proponent must prepare an Environmental Impact Assessment (EIA) for new projects and/or extension of existing facilities. According to the law, the EIA must be submitted to the Competent Administrative Authority (CAA) under whose jurisdiction the project falls. The CAA should assess the environmental impacts of the project and send the EIA to EEAA to issue its response within 60 days. If no response is received by the end of this period, the study is automatically approved. The proponent is informed of the decision and, in the event of an approval, the required conditions for both construction and operation phases. The proponent has the right to issue an appeal within 30 days from the receipt of the decision.

According to the Egyptian Guidelines for EIA (EEAA, 1996), proposed developments are classified into three categories according to the severity of potential impacts. They reflect the increasing levels of environmental impact. The three categories are:

- Category A: projects with minor environmental impacts
- Category B: projects with substantial impacts
- Category C: projects with potentially high impacts

Therefore, the CAA with assistance from EEAA should carry out a screening for each proposed project to identify the EIA category under which the project falls. This is usually carried out using the project lists prepared by EEAA. In case the project is not listed, EEAA has the right to assign the project to an appropriate level of assessment A, B, scoped or C.

Set back lines

Law 4/94 for the environment prohibits the construction of any establishment within 200 meters of the Egyptian coast line unless there is permission to do so from the competent administrative authority in coordination with the EEAA. Executive Regulations of the Law add that building permits for any construction within the 200m zone also require the approval of the Shore Protection Authority (SPA), in coordination with the EEAA. The SPA Environmental Guidelines for Development in Coastal Areas, prepared by the EEAA, identify the coastal building front line as follows:

- In undeveloped land zones, i.e. virgin coastal stretches, the Coastal Building Front Line (CBFL) should be located not less than 200 m back from the highest high-tidal shoreline in accordance with Law 4/1994;
- In rocky or cliff-face shore fronts, a reduced set-back distance, i.e. less than 200 m, may be adopted on the condition that proper construction safety measures are fulfilled. A minimum distance must be set by inspection by the administrative authority in coordination with the Egyptian Environmental Affairs Agency.

Protection of Biodiversity

Article 28 of Law 4 of 1994 forbids hunting, shooting or catching the types of birds and wild animals specified in the Executive Regulations of the law. It also forbids the possession, transportation, carrying or selling of (or offering to sell) these birds and animals either dead or alive. The article also forbids damaging the nests or the eggs of these birds.

Article 23 of the Executive Regulations forbids causing harm to these birds and animals, as well as possessing or selling them either dead or alive, as prescribed in Annex 4 (of Law 4/1994). The provisions of this article shall apply in all natural reserve areas and also in areas where animals and birds are threatened with extinction, and for which a decree by the Minister of Agriculture or by Governors has been issued in coordination with the EEAA.

Article 24 of the Executive Regulations specifies that it is forbidden to issue permits for the hunting of wild birds and animals prescribed in Annex 4 (of Law 4/1994) of the ER except for scientific research purposes or for overcoming the spread of an epidemic or for other purposes approved by the EEAA.

Annex 4 (of Law 4/1994) identifies the above mentioned birds and wild animals as follows:

- Birds and animals stated on the list attached to decree of the Minister of Agriculture No. 28 of 1967, issued in implementation of the provisions of article 117 of Law No. 53 of 1966 promulgating the Law on Agriculture;
- Any other birds or animals to be determined by international conventions to which Egypt is a party;
- Any other birds or animals for which a decree shall be issued by the Minister of Agriculture with the agreement of the EEAA.

Law 102/1984 (Law of Natural Protectorates)

Law 102/1983 establishes the legal framework for the creation and management of protected areas in Egypt. According to this law, human activities are to be strictly controlled in the protected areas.

Any activities proposed within protected areas are subject to the approval of the CAA, in this case it is the Nature Protection Department (NPD) and the EEAA. Such approvals are also subject to EIA requirements. In this case, the EIA is submitted to the NPD for review and comments. Then, the EIA is sent to EIA Central Department, EEAA, to issue the final opinion. NPD has put conditions and rules for any developments within protected areas according to the nature, purpose and management plans of each. These should be observed while developing within the particular protected area.

3.32 USAID Environmental Procedures (22 CFR 216)

According to section 216.6(c) of the USAID's environmental procedures (22 CFR 216), programs, projects or activities which are financed by USAID are required to submit an Environmental Assessment (EA). The Environmental Assessment is a detailed study of the reasonably foreseeable environmental impacts, both positive and negative, of a proposed USAID

action and its reasonable alternatives. It includes alternatives which would avoid or minimize adverse effects or enhance the quality of the environment so that the expected benefits of development objectives can be weighed against any adverse impacts upon the human environment or any irreversible commitment of resources.

The typical approach to conducting an EA under the USAID environmental procedures is to assess the specific proposed interventions at the specific proposed locations for those interventions (along with reasonable alternatives to the proposed interventions and/or proposed locations). This approach is well-suited to a situation in which the proposed interventions and proposed locations are well-defined. However, in cases where the project objectives, along with political and institutional realities, require that the project has the flexibility to determine specific interventions and specific locations for these interventions on an ongoing basis, the typical EA approach is less effective.

In such cases, USAID has increasingly employed the PEA approach because a PEA allows for the assessment of a set of proposed interventions within a defined geographic area in which environmental baseline conditions are known and potential impacts can be accurately predicted. The interventions proposed by the LRS project meet the criteria for a PEA because a set or “basket” of possible interventions has been defined and the general locations have been determined. However, given the institutional challenges required to make final decisions regarding each specific intervention and each specific location (e.g. obtaining consensus among up to three GOE partners, plus a range of other stakeholders), it is not practical to conduct the required EA for either each intervention as it is finalized on a rolling basis or for all interventions after all have been finalized. Either of these alternatives would delay project implementation beyond the point of project viability.

The PEA approach provide the flexibility to conduct the EA work early in the project implementation cycle, while providing the same level of compliance with USAID environmental requirements, and more importantly, the same level of assurance that proposed interventions will be environmental sound. As described in Section 216.6(d), the PEA approach should, to the extent practicable, follow the same path as a traditional project EA, covering all the steps in the process that are necessary to describe baseline conditions, assess impact and make recommendations to mitigate any potential negative impacts. As such, the PEA will address all of the EA requirements described in Section 216.6(c). The PEA is subject to USAID review and approval under the general procedures (22 CFR 216).

The PEA will result in a set of best practices for engineering and management of all constructed facilities, and a set of mitigation measures to address all potential negative environmental impacts of proposed interventions. In addition, the PEA will include an environmental monitoring plan that will be integrated with the LRS’s existing project Monitoring and Evaluation Plan, to provide long term environmental monitoring of all project interventions. The “toolbox of best practices and mitigation measures will serve as a model for similar physical interventions on other sensitive lands in Egypt.

3.4 Human Environment

The project area is generally defined as the geographic area within and adjacent to Wadi el Gimal National Park, including four significant population centers in the Southern Red Sea (SRS) – Marsa Alam, Abu Ghusun, Hamatah and El Shelateen. Except for Abu Ghusun, all of these population centers are outside the boundaries of the Park, but their populations and their economic activities directly impact the Park. All project activities are located within the southern part of the Red Sea Governorate.

The Red Sea Governorate is divided administratively into six city councils of Ras Ghareb, Hurghada, Qusseir, Safaga, Marsa Alam and El Shelateen. The geographical scope of the study is limited to the administrative centers of Marsa Alam and El Shelateen. Several communities along the coast and inland fall within the jurisdiction of these two administrative centers. Following is a brief summary of the relevant communities within the project area. The total population covered by the project area (which covers the Park and adjacent areas) is 7,800 inhabitants.

3.41 Transport Network

Most visitors access the SRS from the city of Hurghada to the north, which currently offers international commercial air service and extensive marina facilities that enable travelers to use the city as a terrestrial and marine gateway. Commercial and charter buses regularly ply the north-south coastal highway and the port facilities at Hurghada provide marine access. Tourists may travel by means of high speed ferries, charter vessels, or live-aboard vessels.

Access to the SRS has been significantly improved by the recent completion of a major international airport and an enormous private marina facility. These facilities are located approximately 70 kilometers north of Marsa Alam. Marsa Alam International Airport is currently providing regular scheduled commercial services to Italy and Germany. The new marina facility in Port Ghalib is operational and has a mooring capacity for 1,800 vessels. If this capacity were to be fully realized, Port Ghalib would become one of the world's largest marinas. A visitor center was constructed near the new port facility and this will serve to promote visitation to sites throughout the southern zone of the Red Sea. All of these facilities have the potential of adding substantial numbers of tourists to the southern sector of the Red Sea region.

Several roads also connect the SRS to the Delta and Valley including Marsa Alam-Edfu, El Qusier- Qusier and Safaga-Qena. In addition, the Red Sea coastal road is connected to Suez and Cairo through junctions at El Ain El Sukhna.

3.42 WGNP and Relevant Communities and Sites

Following are brief descriptions of WGNP and other communities and sites in which LRS physical interventions are planned. Please note that the site descriptions are followed by satellite images and other maps of several of the target communities. The largest human settlement located in the SRS is the city of Marsa Alam. However, since no physical interventions are planned for Marsa Alam, a summary description is not provided here.

Wadi el Gimal National Park

Wadi el Gimal National Park is a recently established marine and terrestrial protectorate in the Southern Red Sea, located 325 km south of Hurghada, the protectorate includes a marine component of 1,600 km², and a terrestrial component of 4,400 km². The Park includes approximately 100 km of coastline, extends eastward approximately 15 km into the sea, and extends around 55 km into the mountainous hinterland. Its northern and southern coastal borders are at the Shams Alam resort and the village of Hamatah, respectively. There is a ranger station located at both the northern and southern coastal boundaries.

The Park includes a number of islands (e.g. Wadi el Gimal Island), numerous fringing and offshore reefs, a number of valleys (wadis), and some antiquities sites. The Park also includes a number of small communities, notably Sharm Luliyah, Abu Ghusun and Qul'an Bay, all of which are targets for LRS physical interventions. The housing settlements are inhabited mainly by native tribes and migrants from nearby governorates in Upper Egypt. The total population inside the protected area is approximately 1,000 inhabitants.

Sharm Luliyah

Located 58 km south of Marsa Alam, Sharm Luliyah is among the largest enbayments or *sharms* in the SRS. A small community of fishermen comprised primarily of member of the Gulaan community. There are approximately 30 total residents is located at Sharm Luliyah. There is also a small coast guard station. There are no public services for residents.

Abu Ghusun

Situated 80 km south of Marsa Alam, Abu Ghusun is inhabited by a relatively large population of about 1,600 persons, approximately 200 of whom are settlers from other parts of Egypt. The Phosphates Company and the civil service employ around 80% of the workforce, while the rest are involved in fishing or herding activities. Abu Ghusun has two co-educational schools, a primary school, and a preparatory school. It also has a youth center, a first aid center and a health unit. Most houses are provided by the state as part of a settlement program, in accordance with family needs and size. The Phosphates Company and the City Council supply electricity to the community. There is also a port at Abu Ghusun that belongs to the Phosphates Company.



Figure 3.15: Sharm Luliyah



Figure 3.16: Qul'an Bay

Qul'an Bay

Located approximately 120 km south of Marsa Alam and 10 km north of the village of Hamatah, Qul'an Bay is a relatively large embayment, covering approximately 16 km² on the east side of the coastal highway. Qul'an Bay sits at the confluence of several small wadis that drain the Gebal Hamatah foothills. The Bay has a nearly enclosed lagoon, with a narrow opening to the northwest. It also includes a relatively robust mangrove stand which encircles much of the bay. There is a small Bedouin (*Ababda*) community living at Qul'an comprised of 17 families who live in improvised shacks made from scrap wood and other materials. The community exists primarily by fishing the local reefs. There are no public services for residents.



Figure 3.17: Qul'an Bay Settlement

Sikait

Sikait is a Roman-era emerald mining site located inside the boundaries of WGNP, approximately 60 km west of the northern coastal entrance to the park. The site, which is extremely isolated deep in Wadi Sikait, is not currently inhabited. The site includes the ruins of numerous buildings built on the

steep hillsides that form the wadi and constructed from local stone that supported the mining operation.



Figure 3.18: Sikait

Hamatah

Hamatah is home to 65 families (320 individuals) and lies 110 km to the south of Marsa Alam. The majority of the workforce is engaged in either herding or fishing, while about 20% are engaged in tourism-related activities. There are two schools – a primary and preparatory school – as well as a children's nursery and a first aid center. An electricity generator and a water distillation plant supply the community with electricity and potable water. The Berenice Local Council premises are located in Hamatah.

El Shelateen

El Shelateen is located 250 km to the south of Marsa Alam. The population of El Shelateen is made up of people of the Ababda and Bisharin tribes as well as some Rashayda (who have migrated from the Sudan but whose ancestors were from the Arabian Peninsula) and some settlers from the Nile Valley. The majority of the Ababda and Bisharin are either herders or work as traders in El Shelateen market. While some of the Ababda and Bisharin are involved in fishing, new settlers from the Nile Delta, especially those who have experience in fishing, dominate this activity.

El Shelateen market is a hub of trade-related activity and the Camel market is a major tourist attraction. Most merchants are from Sudan, various governorates of Egypt or are from among the more prosperous local nomads. As part of its settlement plan for nomads in El Shelateen, concrete houses have been provided by the state. So far, however, only a limited number of houses have been built, dispersed over the city. The majority of the population still lives in wooden shacks made of sheets of compressed wood, while some, particularly those living in the mountains further inland, are living in shacks made of timber.

Public amenities in El Shelateen include electricity, a distillation plant providing water to the community and transportation in the form of privately owned minibuses. There are primary, preparatory and secondary schools in El Shelateen as well as an Azhar Institute for all school levels. Social facilities are provided through the local CDA, which has a youth club, a children's club, a women's club and a senior citizen's club. An independent youth and sports club is also found in El Shelateen. El Shelateen council oversees five local units: Marsa Hemeira, Abrak, Ras Haderba, Abu Ramad and Halayeb. Only Marsa Hemeira falls within the geographic scope of the study.

3.43 Other human settlements of interest

North of Wadi el Gimal National Park

Marsa Alam City

Marsa Alam is located 60 km north of the Wadi el Gimal National Park, and 270 km south of Hurghada and 130 km south of Quseir. It is situated on the T-junction that connects Edfu (in the Nile Valley, 220 km west of Marsa Alam) to the Red Sea coast. Marsa Alam is a promising tourist destination because of its pristine beaches and marine ecosystems that are unique to the Red Sea, and because of the many ancient heritage sites located further south of the city. Scattered along the southern coast of Marsa Alam are numerous hotels and tourist resorts that are attracting a growing number of tourists, especially since the establishment of Marsa Alam airport, north of the city.

The total population of Marsa Alam is approximately 4,750. About 90% of the population is Ababda, while the rest are new settlers from the Nile Valley. The majority of the population is engaged in brokerage, mining, fishing, herding and trading. Positions in the civil services and tourist industry tend to be dominated by new settlers.

Marsa Alam has one functioning hospital, primary, preparatory and secondary schools for boys and girls, an Azhar school for boys and girls in their primary and secondary years, a social unit, a registry office, a health unit, a post office and a community development association (CDA). The CDA runs two nurseries, a social club, a women's club and a children's club. A distillation plant supplies the community with potable water. Electricity is also available. Marsa Alam is divided administratively into two local council units: Berenice and Sheikh Shazly. Transportation facilities between Marsa Alam and other cities, towns or communities are available in the form of minibuses and/or coaches except that there are no formal or regular transportation facilities

to Sheikh Shazly, which is a matter of concern to the local communities. (Sheikh Shazly falls outside the scope of this study.

Awlad Baraka

The community of Awlad Baraka lies 14 km south of Marsa Alam. It is made up of 32 families (about 120 individuals) who rely mostly on fishing for a living. Because of their proximity to some tourist camps, about 40% of the inhabitants are employed in tourism- as cleaners, boat guides, or sailors. Animal husbandry is practiced on a small scale, for family consumption purposes. The neighboring tourist camp supplies the community with electricity.

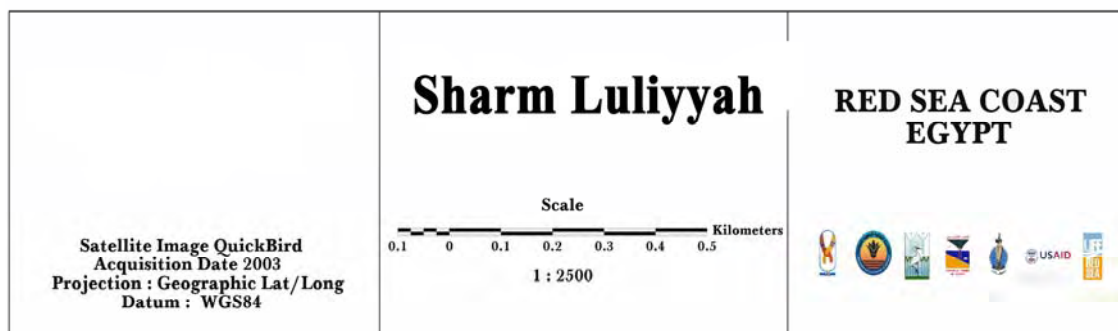
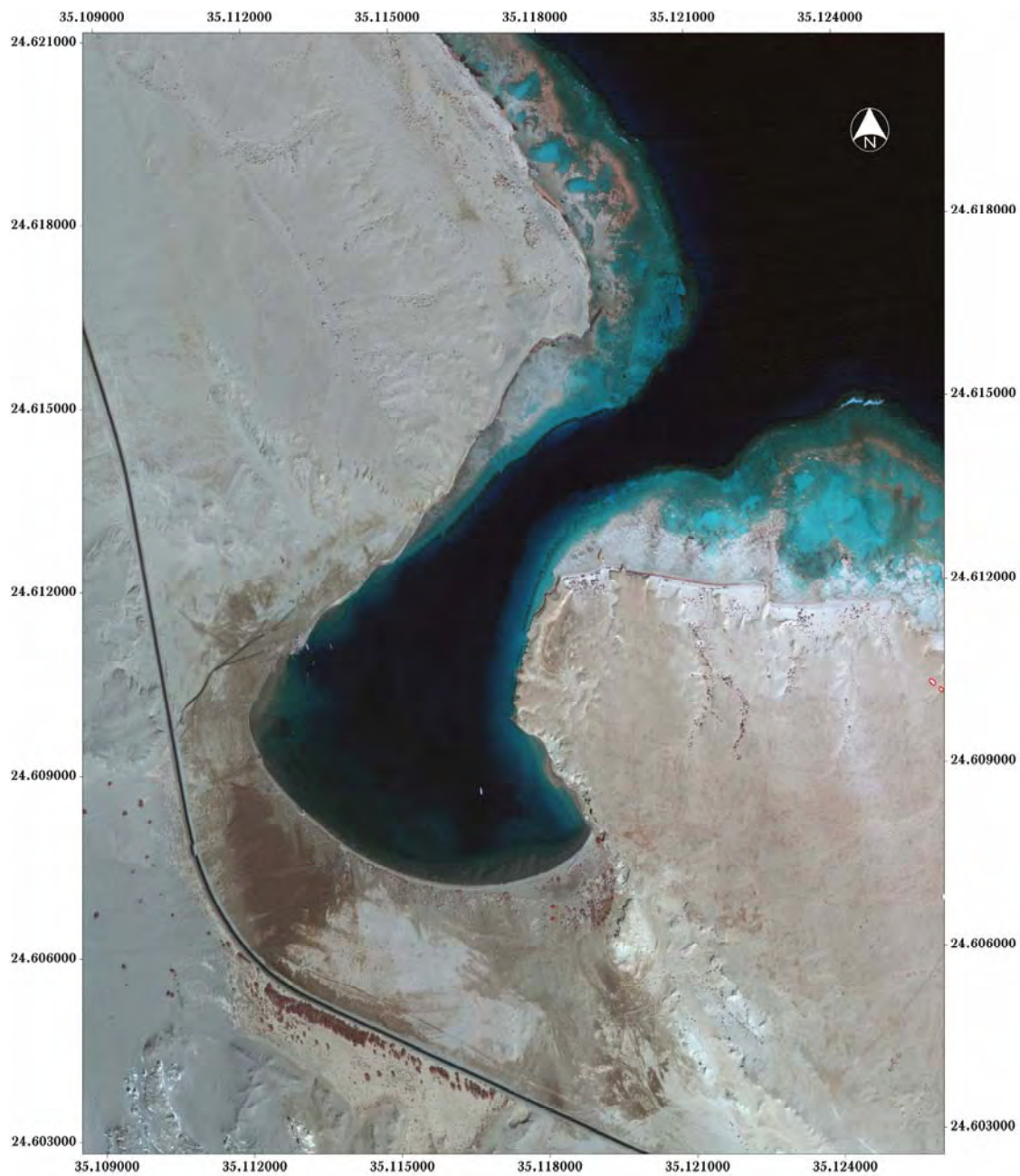
South of Wadi el Gimal National Park

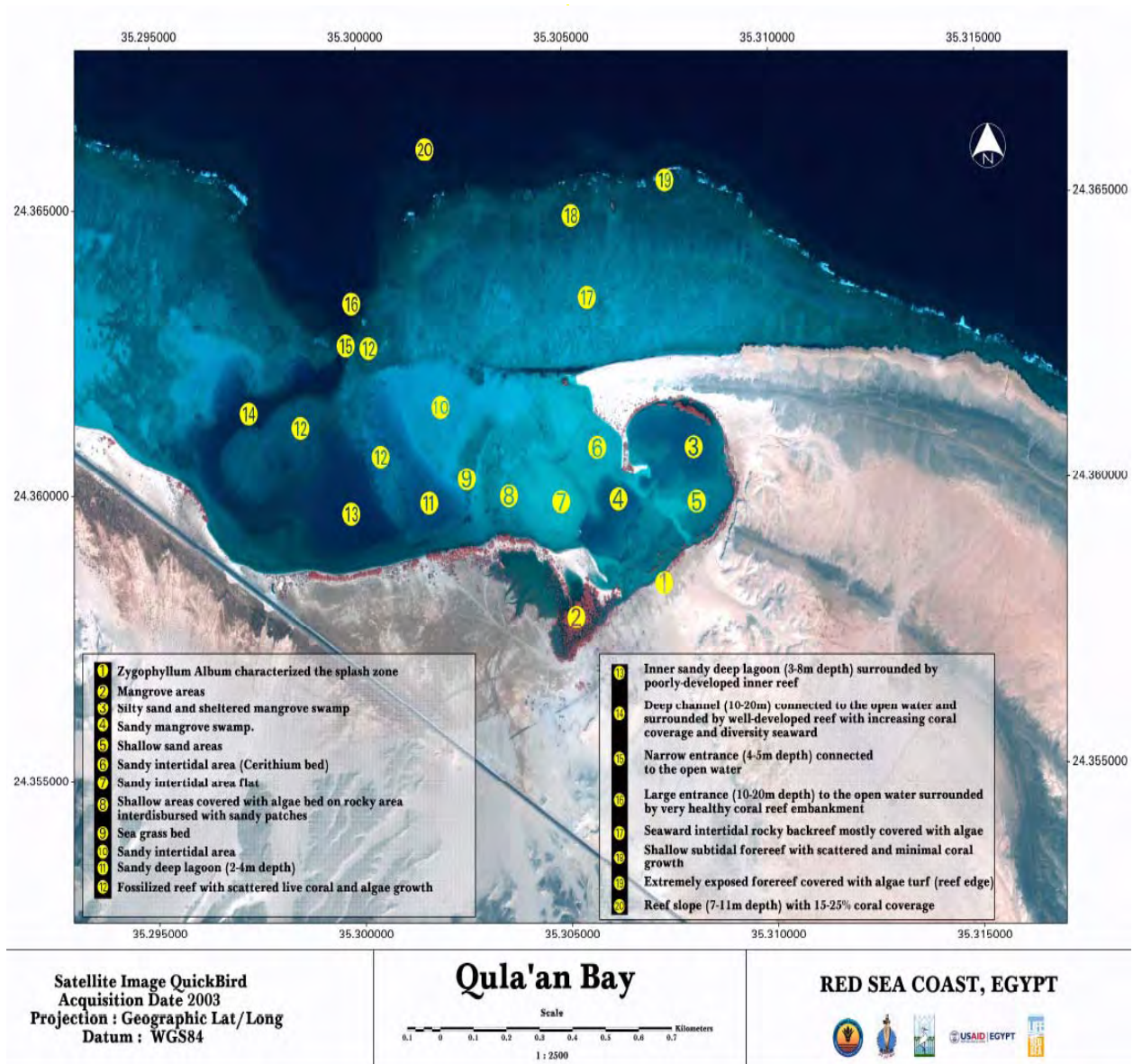
Berenice

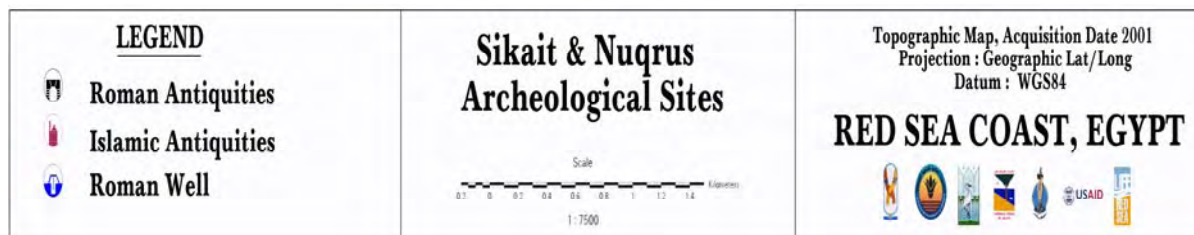
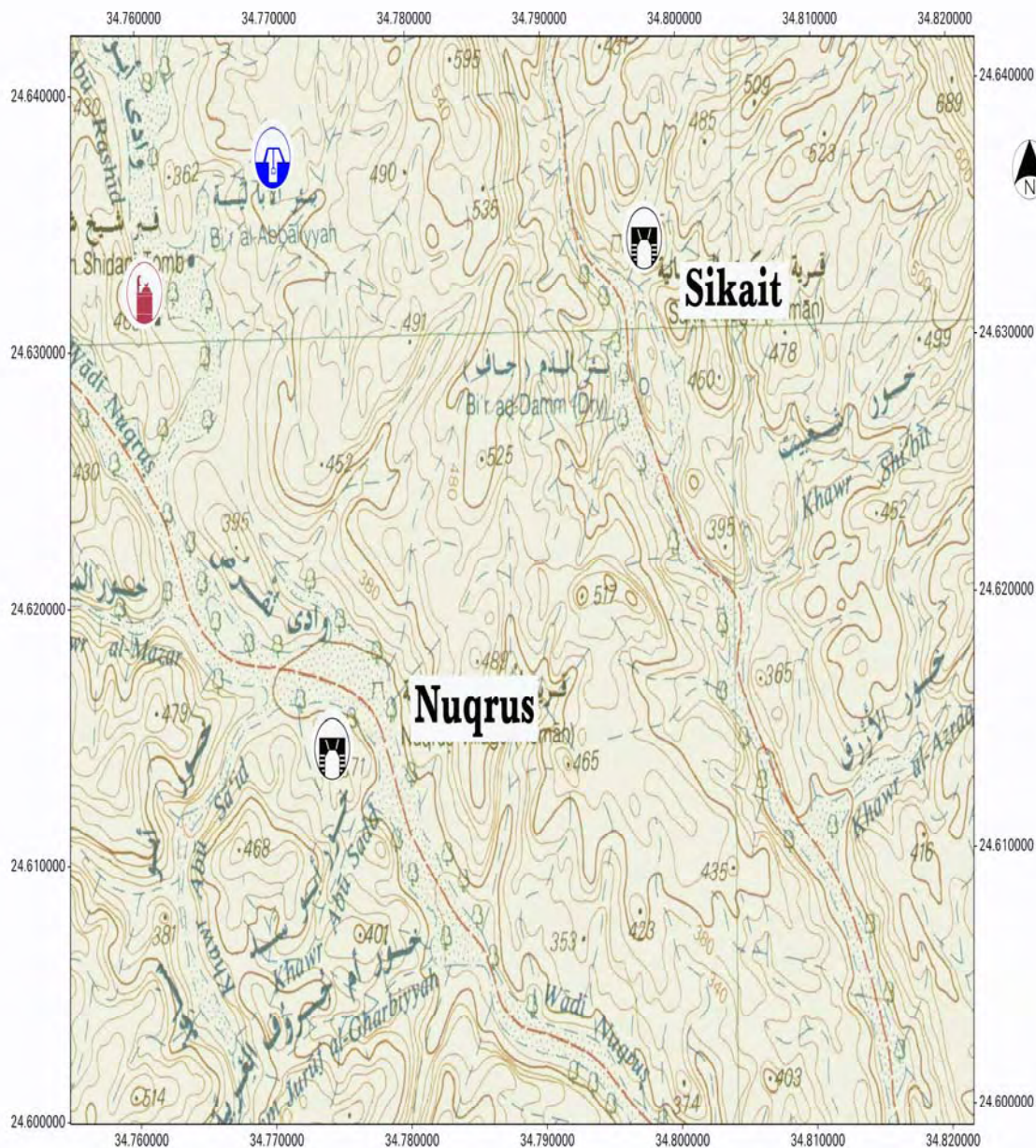
Berenice is situated on a highway 110km south of Marsa Alam. This ancient trading port (founded in approximately 257 BC) hosts some of the country's Roman treasures. Remains of the Semiramis Temple are situated near the modern town. About 170-180 families (approximately 900 individuals) make up the community of Berenice. The majority of the inhabitants (about 80%) are herders, while the rest of the population depends on fishing for a living. Berenice boasts a primary school and a preparatory school, a first aid center, a weaving center for girls and a military airport. A generator supplies the town with electricity. Several communities fall within the geographic scope of the Berenice Local Unit. These are listed below in order of proximity to Marsa Alam.

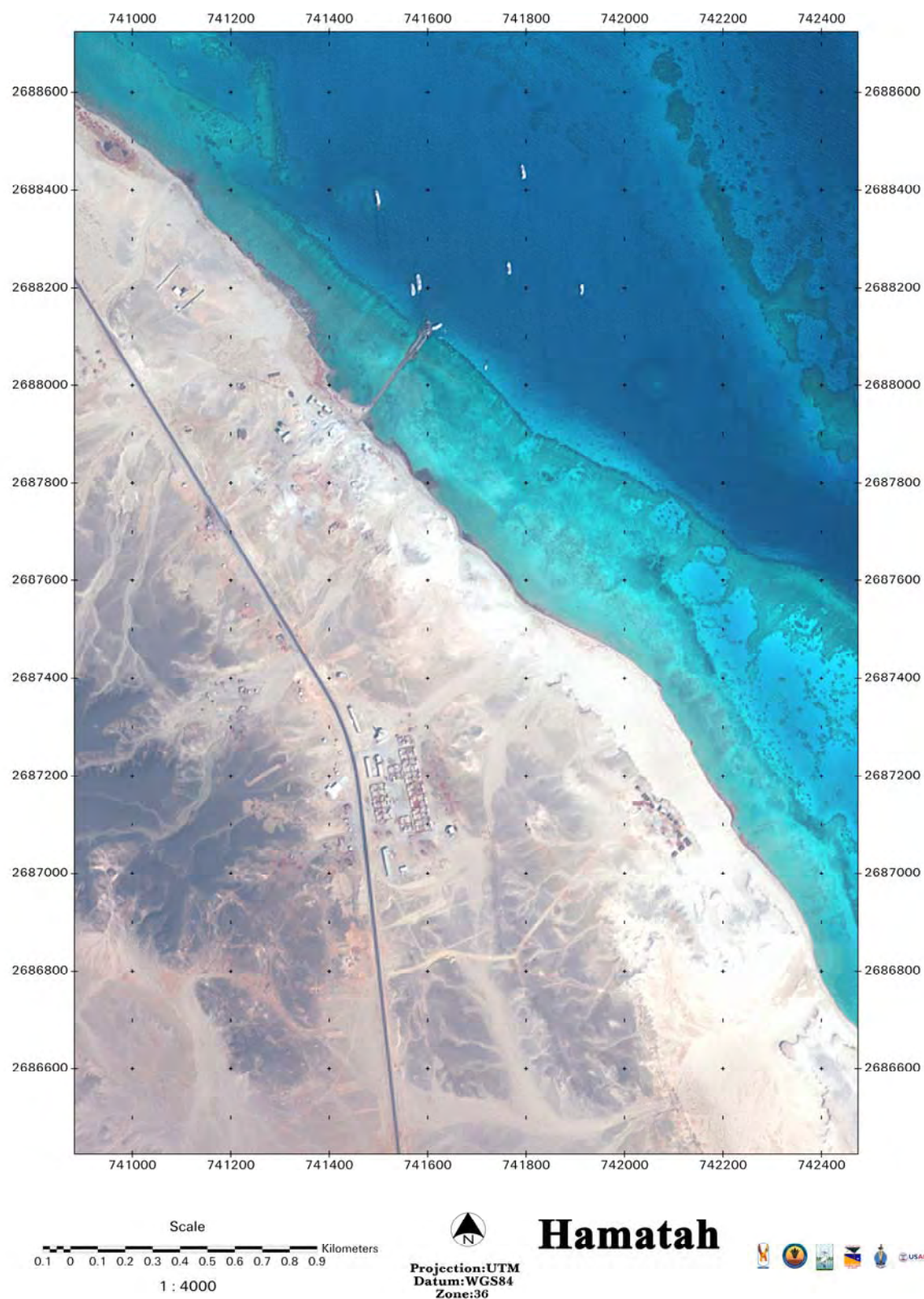
Ras Banas

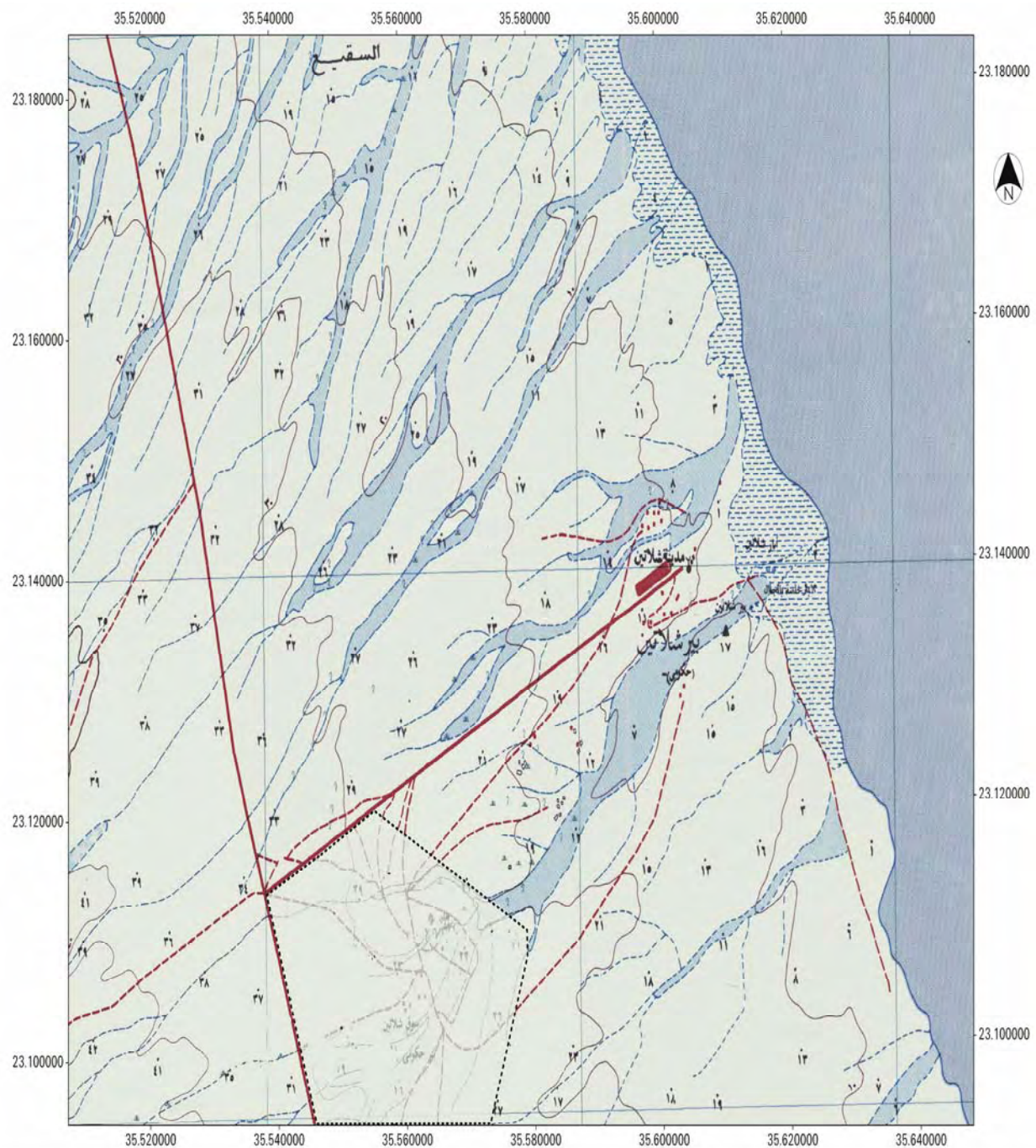
The fishing community of Ras Banas is situated 180 km south of Marsa Alam, 50 km of which are off the paved road further along the coast. No facilities are available to its 60 families. The Hamatah Local Council transport water to Ras Banas. A generator is available, but it is out of order most of the time. In addition, there are other small settlements located in the deep mountain area as Sheikh Shazly, Sheikh Sidi Salem and Hafafeet.







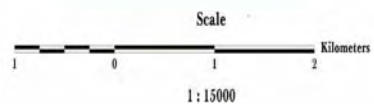




El Shelateen

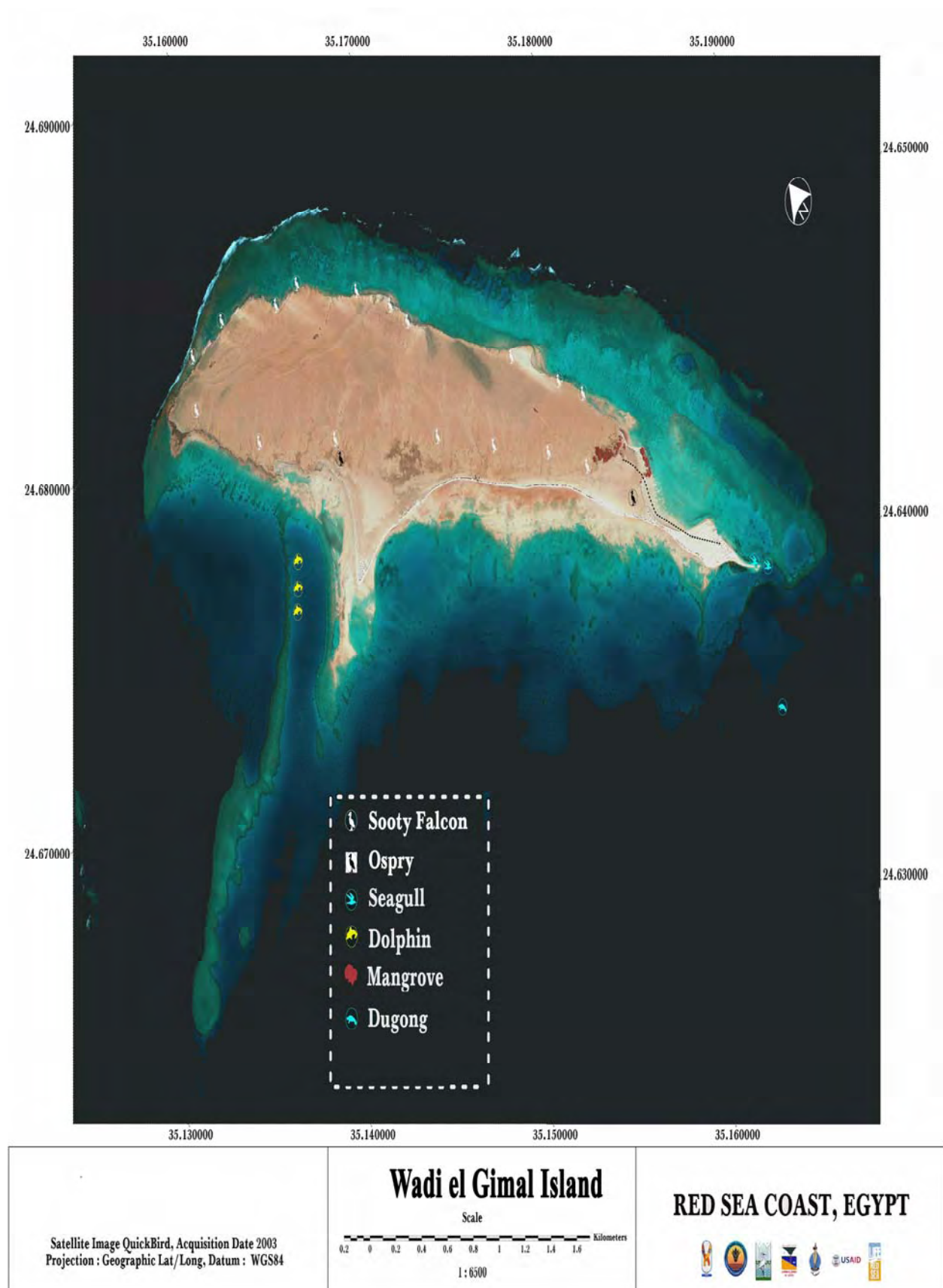
Topographic Map, Acquisition Date 2001
Projection : Geographic Lat/Long, Datum : WGS84

Commercial & Camel Market



RED SEA COAST, EGYPT





Other Pressures on Wadi el Gimal National Park and the surrounding areas

In addition to the municipalities and informal settlements located within the project area, there are a number of current and planned resort communities. These communities are developed by TDA and are called Integrated Development Corporations (IDCs). IDCs are essentially self-contained quasi-municipal entities that are privately-owned and that provide their own basic services, including electricity, water supply, sewerage, solid waste management and security. Guests visiting an IDC generally stay within its boundaries for the majority of their stay, using the IDCs hotels, golf courses, private beaches and other amenities. But some do venture out into the surrounding area to visit WGNP and other destinations in the region. Over time, the IDCs will place increasing pressure on the region's resources both in terms of increased visitation outside the IDC and increased resource use by the IDC itself. Table 3.1 shows current and planned IDC development in the Southern Red Sea region.

Table 3.1: Current and Planned IDCs in the Southern Red Sea

IDC Name	Location	No. Of Hotels		No. Of Rooms	
		Planned	Operating	Planned	Operating
Gabel El Gezeera El Hamra	70 Km North Marsa Alam	24	6	12,000	1,000
Marsa Shuni	50 Km North Marsa Alam	27	1	7,500	200
Marsa Murayn	43 Km North Marsa Alam	11	0	2,000	0
Marsa EL Nabi As-Saghir	30 Km North Marsa Alam	13	2	4,000	190
Marsa Shagraa	25 Km North Marsa Alam	29	10	6,000	2,030
Rasl Ad- Dirri	22 Km South Marsa Alam	30	1	7,700	50
Marsa Sharm AL Foqayrah	42 Km South Marsa Alam	11	1	8,400	160
Ras Hunkurab	65 Km South Marsa Alam	14	0	4,400	0
Hamatah	105 Km South Marsa Alam	10	0	2,000	0
Lahami	120 Km South Marsa Alam	23	3	6700	270

3.44 Socioeconomic Features

General Description of the Population of the Area

Although the Eastern Desert seems desolate and uninhabitable, the area has been formed and maintained by human beings for millennia and is the homeland of indigenous populations with ethnic and cultural roots in this desert. In the Egyptian Southern Red Sea area, the population is composed of the following groups:

- Ababda
- Bisharin
- Rashayda
- Sedentarized Egyptians of the Nile Valley

The Beja people, to which the Ababda and the Bisharin tribes belong, are descendants of the Medja and the Blemmyes tribes that have been living in the Red Sea area for more than 4,000 years. Bejas are originally pastoral nomads that depend on animal husbandry. There are around 63,000 Beja people living in Egypt nowadays who are native Africans. They are called Ababda and Bisharin according to the kind of dialect they speak. The Rashayda is a pastoral group of Arabs that immigrated during the 19th century and settled in the Sudan, but are also found in the southernmost part of the Egyptian Eastern Desert.

The fifth population group is Nile Valley Egyptians who were originally farmers and traders and have only come to the Red Sea area during the last 50 years. The majority of them are from Upper Egypt. Very recently, a third emigration took place. It is linked to the tourist development of the area and consists mostly of Egyptians from the Nile Valley and Delta that came to work in the newly established hotels. They are generally single men, staying in the area for the duration of their work and frequently traveling back to their hometowns.

Traditional Land Use Patterns

Rangeland

The southern part of the Eastern Desert is rangeland where about 15,000 pastoralists live in the desert or on its margins. Their traditional system is essentially nomadic with seasonal movement of flocks in search of water and grazing. Their economy is characterized by seven key elements: sheep herding, goat-herding, camel-herding, charcoal production, collection of medicinal plants and temporal cultivation in ecologically favorable habitats, and fishing.

Mineral Resources

The southern Eastern Desert is well known for its wealth of mineral resources in metals and ornamental stones. At the present time, there are more than 200 mines in the larger southern Red Sea area, the majority extracting barites, quartz and feldspar. There are also several iron, almanite, phosphate, kaolin and talc mines. A total of about 600 quarries exist in the desert, extracting argil, sandstone, granite, marble, sand pebbles and clay. According to the 1993 Environmental Profile of Aswan, approximately 10,000 workers are employed in mines and quarries in the wider Eastern Desert.

Desert Tourism and Wildlife

The southern Red Sea area, with its fascinating landscape, interesting geological formations, rich wild life and numerous historical sites attracts naturalist, scientists, tourists and hunters.

Marine tourism and Fishing

The SRS region has an amazing diversity of marine tourist activities, including diving, snorkeling, marine sports and yachting. Also, fishing activities are available for recreational and industrial purposes on both a small or a wide scale.

Key Demographical Features of the project area

Population Distribution

The Aswan Boundaries District: It includes three districts: Marsa Alam District; El Shelateen District; and Halayeb District. The most important urban settlements are Marsa Alam City, Sheikh el Shazli Village, El-Thalatheen, Berenice Village, Abu Ghusun, El Shelateen, Abu-Ramad, and Halayeb. The Aswan District extends for almost 460 Km and its inhabitants represent 10.63% of the Governorate's inhabitants according to 1996 statistics.

Table 3.2: Quantitative and Percentage Population Distribution-1996 statistics

Districts	Inhabitants	Percentage
Marsa Alam District	3,377	3.17
El Shelateen District	9,947	6.39
Halayeb District	1,665	1.07
Red Sea Governorate	155,695	100.00

The District of Marsa Alam is divided into three administrative units: Marsa Alam City Unit, Sheikh Shazli Village Unit and Berenice Village Unit. According to the 1996 population census of CAPMAS, the total number of inhabitants in 1996 was 3,377. The table below illustrates the population distribution according to the administrative units.

Table 3.3: Population of Marsa Alam District-by District Units

	Marsa Alam City Unit			Berenice Village Unit			Sheikh Shazli Village Unit		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total Inhabitants	928	718	1,646	572	448	1,020	366	350	716
Number < 6 years old	139	119	258	82	105	187	31	33	64
Number 6-15 years old	181	189	370	132	101	233	37	52	89
Number 15-65 years old	585	401	986	343	239	582	285	253	538
Number > 65 years old	23	9	32	15	3	18	13	12	25

In the Marsa Alam district 44.7% of the district population is female, 55.2% male and 45% of the district's population is below 20 years old. Only 4.6% of the population is older than 60 years. The average family size in the district is 3.94 persons per family. This is less than the average family size at Governorate level, which is 4.56 persons per family.

Education

The majority of the population is illiterate; very few can read and write. An insignificant percentage have a university degree, intermediate or vocational training. The illiteracy rate of Marsa Alam District is more than twice as high as the comparable rate of the Governorate, with 1,826 persons out of 3,382 being illiterate. The illiteracy rate of the female population in Marsa Alam District is 66%. This is twice the average for the female population of the Red Sea Governorate. The illiteracy rate of the male population of the District is 44.8%, nearly three times the average figure for the male Red Sea Governorate population. There are only eight primary schools in Marsa Alam, serving 1,116 students who represent 10.2% of the city's population. Marsa Alam has seven preparatory schools and three secondary schools serving 287 and 58 students respectively

The city of El Shelateen has a primary and a secondary school, and a trade institute. Classroom density varies between 20 to 30 students per class. The primary and secondary school buildings in the city of Hamatah are in very poor condition and the general cleanliness both inside and outside the schools is very poor. Additionally, well-trained teachers and social workers, as well as female teachers, are sorely lacking. Sheikh Shazli has the highest illiteracy rate of the district; 85.4% of the population of the district cannot read and write.

Health services

Marsa Alam has one operating hospital, one family clinic and one ambulance. El Shelateen has one general hospital which provides adequate health care service, but lacks equipment and specialized service providers. It also has two operating ambulances. Hamatah has one health unit which suffers from a severe shortage of medical equipment and professionals. The city council, however, in collaboration with the Ministry of Health, organizes immunization campaigns every three months for both urban and desert dwellers.

Economic Sectors

The main sources of income are animal husbandry (the most important), fishing, trade, crafts, tourism and labor. Almost all the population obtains its income through a primary and a secondary occupation, which includes security work, driving and working in coffee shops. The average household size is between five to seven members. The most important sectoral employer in Marsa Alam City Unit is the Government, which employs 39% of the urban work force. In the rural areas of the district, the dominant sector is private businesses, which employs 39.7% of the active work force. At the Governorate level, 20.2% of the work force is employed by private enterprises. In Marsa Alam City Unit, 157 people out of 1,018 work in financial intermediation, real estate and business activities whilst 109 persons work in public administration or defense and 60 people work in educational establishments.

In the Sheikh Shazli Village Unit, 274 out of 563 people work in fishing, agriculture, hunting or logging whilst 18 work in public administration and eight people work in the mining sector. In the Berenice Village Unit, agriculture, hunting, forestry and fishing are equally important (as in Sheikh Shazli) and employ 187 people. The second most important sector is mining, which employs 111 people. Seven people are employed by the public administration. Male and female members of the society are found to be involved with varying degrees in various roles and responsibilities that can be grouped into three main categories, namely:

- ***Reproductive role:*** includes provision of food and water, preparation of shelter, planting and tending small home gardens.
- ***Productive role:*** includes animal herding, fishing, marketing, handicraft production, tailoring, and employment in the private and public sectors.
- ***Community Management:*** includes collective activities done for a larger group of society's members such as herding, membership in community organizations and fishing associations.

Water Sources

The majority of the population receives drinking water from the City Council's water distribution. City dwellers receive water directly in their houses where they get their water tanks filled. The water coming to their houses is distilled water from the sea and hence is too salty for consumption and often gets used for washing. Drinking water comes from Aswan, which is also the case in Abu Ghusun. To fill the tank, inhabitants have to pay between LE.10 in winter and LE.15 in summer. For those families whose main bread winner works in a mining company, the water is distributed by their employer for free. In other parts, like Wadi Lahmy, people obtain their drinking water from deep wells in the area.

The household consumption of a family with six members is estimated at one cubic meter every 7 days in summer and one cubic meter every 10 days in winter. This brings the individual consumption to 251 liters per day which is significantly below the minimum standard of WHO (701/d/c). Desert dwellers leave their empty water tanks on the main road where the city council comes to fill them for free. The only cost they have to pay is for the transportation of the water tanks. A car can charge between LE 30–50 to transport the water tanks to their shelters. In the summer, water consumption increases and thus their weekly water transportation costs also increase. Animals in both the desert as well as the villages are provided with their drinking water from the wells which are close by and have to be fetched by family members. The water is known to be unsuitable for human consumption because it is polluted and far too salty for human use. In severe cases, however, when there is no other water available, human beings resort to well water for drinking.

Basic Infrastructure

Table 3.4: Basic Infrastructure in Villages

Service/Facility	Marsa Alam	Hamatah	Abu Ghusun	Awlad Baraka	Qul'an	El Shelateen
Health Unit	✓	✓	✓			✓
Primary School	✓	✓	✓			✓
Secondary School	✓		✓			✓
Electricity	✓	9:00am-2:00pm 7:00pm-2:00am	✓	✓	✓	✓
Veterinary	✓					✓
Paved Road	✓	Coastal Highway				✓
Mobile Health Unit			✓			
Sanitation Services	✓					
Fresh Water	✓					From desalination plant (not potable)
Market	✓					✓

Table 3.5: Other Infrastructure in Wadis

Location	Mobile Grocery	Water Truck	Bedouin Tent	Well	Grocery	School
Wadi El Nakari						
Wadi Abu Ghalagah						
Wadi Gadir	✓ ¹					
Wadi Om Ghariga	✓ ¹					
Wadi Ambud						
Wadi/Gebel El Sukari		✓ ²				
Wadi Lahmy			✓	✓		
Wadi Halfi					✓	✓
Wadi Rakhama						
Wadi Raghda						

¹Twice a week; ²distributes water to worker's shelter

Patterns of Mobility

The nomadic origin of people is clearly manifested in their high mobility. There are numerous reasons behind the constant move of the nomads. Rain, occupation and lately, school enrollment, are the most decisive ones.

Because they live far from civilization, they have to travel distances to obtain their goods, to receive health services or to apply for bureaucratic certificates from towns and cities such as Marsa Alam, Edfu, Qoseir and Aswan. They generally remain in the same wadi although from time to time may move to different locations. Surveys reveal that more than 80% of the population had a length of settlement that exceeded 10 years.

Problems and Needs

During the interviews with stakeholders, various problems were expressed which relate primarily to institutional concerns, e.g. lack of veterinary units, lack of funds for social clubs, lack of female extension staff, or economic concerns, e.g. marketing, work opportunities, etc., or to housing e.g. quality of house construction, electricity short cuts, and concerns regarding health. Needs expressed relate primarily to increase of economic opportunities, training courses and improvement of services and facilities.

Section Four: Description of Proposed Activities

As discussed in Section One, *Introduction to the LRS Project*, the scope of this PEA is limited to the project's planned physical interventions. All other project activities, including technical assistance, training and equipment procurement has received a categorical exclusion from further consideration under USAID's environmental procedures. As discussed in Section Two, *Background on the PEA*, the specific physical interventions to be constructed and the specific locations for these interventions are not known at this time. These uncertainties are balanced against the following factors:

- a well-defined set or “basket” of possible interventions from which the actual interventions will be selected
- a well-defined set of general locations in which planned interventions will be implemented
- reliable baseline data on the physical, human and institutional environment in which planned interventions will be implemented

Together the uncertainties and the known factors make a strong case for undertaking a PEA to assure that the LRS project complies with the requirements of USAID's environmental procedures, guarantees the environmental soundness of all physical interventions and provide the project's implementing partners the maximum flexibility to effectively plan and implement project activities. Accordingly, USAID approved completion of a PEA for the project.

The LRS physical interventions fall into two general categories:

- Community Development Infrastructure in targeted Southern Red Sea communities (supporting LRS Component A)
- Park Infrastructure and Basic Facilities in Wadi el Gimal National Park (supporting LRS Component C)

Table 4.1 provides a complete list of all planned types of physical infrastructure and their general locations.

Table 4.1: LRS Proposed Physical Infrastructure

Category	Types of Planned Interventions	General Locations
Community Development Infrastructure	Community Self-Help Centers	- Qul'an Bay - Hamatah
Community Development Infrastructure	Pit latrines at beaches	- Sharm Luliyyah - Qul'an Bay
Community Development Infrastructure	Fresh water tanks and standpipes	- Sharm Luliyyah - Qul'an Bay
Community Development Infrastructure	Replacement or provision of small power generators	- Qul'an Bay
Community Development Infrastructure	Upgrading/restoration of fishermen houses or other small informal housing units	- Qul'an Bay
Community Development Infrastructure	Construction of model houses for Bedouin fishermen and other local inhabitants	- Hamatah
Community Development Infrastructure	Upgrading local fishing boats for tourist use	- Sharm Luliyyah - Qul'an Bay
Community Development Infrastructure	Handicrafts and Visitors Center	- El Shelateen
Community Development Infrastructure	Planning of camel market and commercial market	- El Shelateen
Community Development Infrastructure	Material Recovery Facilities and small solid waste dumps	- Shagra IDC - Shams Alam vicinity - Hamatah - El Shelateen
Park Infrastructure and Basic Facilities	Ranger Outposts	- WGNP
Park Infrastructure and Basic Facilities	Community Guard Post	- Ras Baghdadi
Park Infrastructure and Basic Facilities	Park Headquarters	- Abu Ghusun
Park Infrastructure and Basic Facilities	Solar power generation systems	- Qul'an Bay - Sikait - Other locations in WGNP
Park Infrastructure and Basic Facilities	Elevated Pedestrian Boardwalk	- Qul'an Bay
Park Infrastructure and Basic Facilities	Nature Trail	- Wadi el Gimal Island - Sharm Luliyyah - Qul'an Bay - Ras Baghdadi

Category	Types of Planned Interventions	General Locations
Park Infrastructure and Basic Facilities	Vehicle access route demarcation	- Various locations within WGNP - Qul'an Bay - Sharm Luliyah - Camel market in El Shelateen
Park Infrastructure and Basic Facilities	Hiking trail demarcation	- Various locations within WGNP
Park Infrastructure and Basic Facilities	Car Park	- WGNP/Coastal - Qul'an Bay - Sharm Luliyah - Ras Baghdadi
Park Infrastructure and Basic Facilities	Camel Yard	- Ras Hunkurab
Park Infrastructure and Basic Facilities	Interpretive Signs	- Wadi el Gimal Island - Sharm Luliyah - Qul'an Bay - Sikait
Park Infrastructure and Basic Facilities	Campground	- WGNP/Sikait - Sharm Luliyah west of the coastal road
Park Infrastructure and Basic Facilities	Installation of mooring buoys at dive sites	- Off-shore, Sharm Luliyah - Off-shore, Qul'an Bay - Off-shore, Wadi el Gimal Island
Park Infrastructure and Basic Facilities	Planting of native vegetation	- Sharm Luliyah
Park Infrastructure and Basic Facilities	Rehabilitation of native mangroves	- Ras Baghdadi
Park Infrastructure and Basic Facilities	Bird watching and observation platforms	- Wadi el Gimal Island - Qul'an Bay - Ras Baghdadi
Park Infrastructure and Basic Facilities	Beach park facilities - Snack bar - Beach parasols - Park benches - Shaded areas	- Wadi el Gimal Island - Sharm Luliyah - Qul'an Bay - Ras Baghdadi
Park Infrastructure and Basic Facilities	Public toilets at beaches	- Wadi el Gimal Island - Sharm Luliyah - Qul'an Bay

4.1 Community Development Infrastructure

The LRS project Component A physical interventions have been called “informal settlement upgrading” in various project documents, in reference to their focus on improving basic livelihood conditions for the poor and generally marginalized residents of the SRS. The PEA team will use the term *Community Development Infrastructure* to denote the more holistic objective of improving overall community livelihood and economic growth potential, with physical infrastructure one aspect of achieving that objective. LRS project physical interventions under Component A complement ongoing technical assistance and training aimed at creating jobs and spurring enterprise development. In support of this technical assistance and training, physical interventions are divided into two subcategories:

- Basic infrastructure to support day to day life
- Enterprise infrastructure to support income generation and tourism development

4.11 Basic infrastructure to support daily life

The LRS project plans to fund construction of a limited quantity of basic infrastructure in targeted communities in the SRS. In all cases, the project will support the planning of infrastructure types and the piloting of specific infrastructure units as models to be replicated with funding and support from non-project sources. Following are brief descriptions of the types of basic infrastructure planned and the general locations envisioned.

Community Self-Help Centers

These centers would serve as gathering space for community activities. The specific uses of the centers would be decided by the community, and likely would include basic education, health clinic space, meeting space, space for other small community services. The buildings would be constructed of brick and concrete, on a concrete slab foundation with a footprint not to exceed 50 m². No water supply sewerage or electricity are planned. The planned general locations for these interventions include Qul'an Bay and Hamatah.

Pit Latrines with Septic Tanks at Beaches

These non-flushing latrines would serve the needs of local residents in targeted communities who currently have no sanitary facilities available. Each

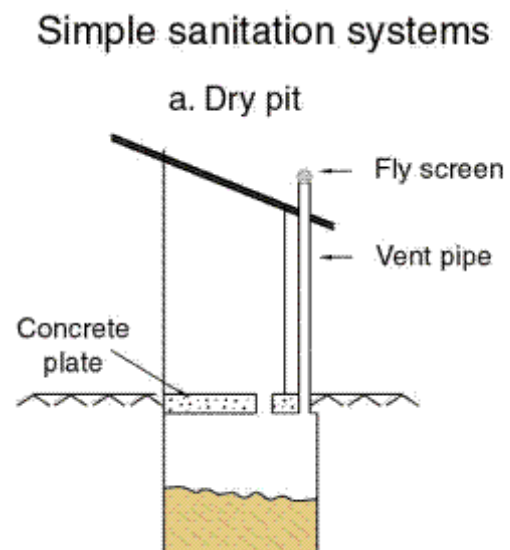


Figure 4.1: Ventilated Pit Latrine

latrine would include a brick and mortar housing, a concrete slab foundation not to exceed 2.5 m², a PVC vent pipe, and a cement-lined fully sealed septic tank (i.e. closed system with no drainage field) with a depth not to exceed 3 m. Approximately eight latrines are planned. The septic tanks would be emptied on a regular basis by trucks. The planned general locations for these interventions include Sharm Luliyah and Qul'an Bay.

Fresh Water Tanks and Standpipes

Because there are no local groundwater or surface water resources in STS coastal areas, residents rely on trucked water for their basic needs. This water is however expensive and of inconsistent quality. Water tanks would be placed on the roofs of existing buildings in the community or on the roofs of building to be constructed by LRS (e.g. community self-help centers). The tanks would be prefabricated polyurethane with an estimated volume of 2000 liters. The tanks would include basic PVC piping to communal standpipes. The planned general locations for these interventions include Sharm Luliyah and Qul'an Bay.

Replacement or Provision of Power Generators

The electric power grid does not serve many small coastal communities in the SRS. The LRS project will procure and install a small diesel powered generator to serve the basic electricity needs of residents currently living in the area around Qul'an Bay. The generator will have an estimated generation capacity of 20kW. The generator and fuel tank will be located on a concrete slab not to exceed 4 m². The project might also purchase and install a larger diesel power generator for use in the village of Hamatah. This generator would have an estimated generation capacity of 800 kW. This generator would be housed in a self-contained structure built on a concrete slab and made of bricks and concrete. The generator would be set apart from housing and other community structures. The planned general locations for these two separate interventions are Qul'an Bay and Hamatah, respectively.

Upgrading and/or Restoration of Fishermen Houses or Other Small Informal Housing Units

The 17 families now resident at Qul'an Bay live in improvised shacks made from scrap wood and other materials with no sanitary services. The primary purpose for improving their dwellings is to improve their living conditions. The second purpose is to improve the overall aesthetic quality of the area as a tourist destination. Increased tourism will benefit the local residents directly by bringing customers to existing local enterprises and providing the locals with incentive to invest in additional enterprises. The housing work planned would be limited to existing structures. No new structures would be built. Wood and other locally available materials would be used. The planned general location for this intervention is Qul'an Bay.

Construction of Model Houses for Bedouin Fishermen and Other Local Inhabitants

The LRS project plans to construct no more than 10 housing units with a maximum footprint of 120 m² per unit. These units would be part of a larger development plan the LRS project has proposed. The buildings would be constructed on a concrete slab, with the building itself made from bricks and concrete. Each house would include water supply (roof tanks) and a flushing toilet connected to a septic tank (shared by several houses) and drainage field, both with necessary piping. The septic tanks and drainage fields would be constructed using best engineering practices, including:

- Septic Tank: Built from concrete and completely sealed, except for the outlet pipe to the drainage field
- Septic Tank: Capacity of no less than 3,000 liters per household
- Drainage Field: At least 100 feet from drinking water sources
- Drainage Field: Slope drainage field away from houses, buildings and any water supply
- Drainage Field: Keep drainage field unshaded and free from trees and shrubbery
- Drainage Field: Allow sufficient space to enlarge the drainage field if it should become necessary
- Drainage Field: Keep septic tanks or drainage field uncovered by driveways or concrete
- Septic Tanks and Drainage Fields: Locate septic tanks and drainfields away from drainage areas and water-ways (the system should be a minimum of 500 m from the Red Sea shoreline.

The planned general location for this intervention is Hamatah.

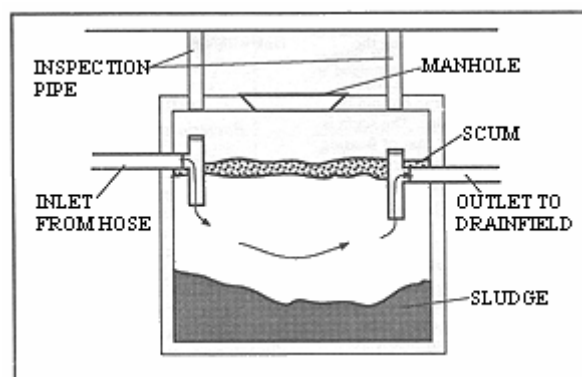


Figure 4.2: Septic Tank

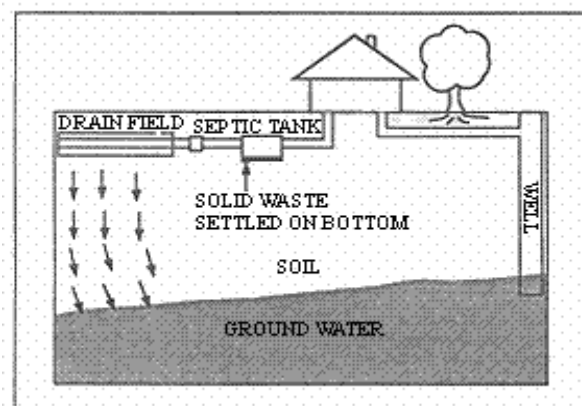


Figure 4.3 Septic system, including drainage field

Material Recovery Facilities and Small Solid Waste Disposal Facilities

The LRS project plans to support the establishment and/or operation of several solid waste management (SWM) facilities. These facilities would in some cases be used for collection, sorting and recycling of materials. In this case, they are termed Material Recovery Facilities (MRFs). Such facilities are only practical when the waste stream entering the facility is primarily or entirely non-organics, completely non-hazardous and comprised of materials for which there is an established wholesale market. The waste stream

from resort facilities (minus the food waste), meets these criteria. Specific descriptions of LRS support to each planned facility follows:

- Shagra IDC – The LRS project plans to support the establishment of an MRF in the proximity of the Shagra Integrated Development Center or IDC,. The site is located about 2 km southwest of Marsa Alam and about 16 km south of the Shagra IDC. The 4,000 m² site is located in the existing Marsa Alam industrial zone will receive waste primarily from the Shagra IDC. The activity is being led by a prominent Non-Governmental Organization (NGO) in the SRS called the Hurghada Environmental Protection and Conservation Association (HEPCA). The LRS funding will be limited to procurement of equipment for the MRF and technical assistance and training for the MRF management and staff. No LRS funds will be used for construction of facilities associated with the MRF.
- Shams Alam – This small MRF, located on the west side of the coastal highway and adjacent to the Shams Alam resort, was established with funds from a previous USAID-funded program called the Egyptian Environmental Policy Program (EEPP). The LRS project will not fund construction of any facilities at the site. LRS assistance is limited to ongoing technical assistance and training for the facility, and procurement of manual compactor for compacting aluminum, plastic and paper prior to transport.
- Hamatah – The LRS project plans to provide funding to plan and construct a small waste sorting facility (not a full MRF) on approximately 100 m² of land to the west of the coastal highway in Hamatah. The facility will include a steel fenced perimeter enclosing the entire site. The site will be graded to make it level. Inside the perimeter no permanent structures will be built. There will be several covered areas made from wood and canvas to provide shade for the employees. There will be equipment on site to sort and process recyclable materials. No solid waste will be kept permanently at the site.
- El Shelateen – There currently is not formal SWM facility in El Shelateen. Solid waste is dumped in a number of sites throughout the municipality, with the largest such site being an informal landfill covering approximately 1,000 m² on the outskirts of the town, near the commercial market. Because there is a large camel market in El Shelateen, animal carcasses also are dumped in the informal landfill. This creates an extremely unsanitary situation, with flies and other disease carries insects attracted to the site. As part of a larger redevelopment plan for El Shelateen, the LRS project plans to construct a number of small SWM facilities, with waste segregated by type. All of these facilities (maximum of three total) will be fenced and include the equipment necessary to process recyclable materials. A separate landfill will be constructed to handle the animal waste from the camel market.

4.12 Enterprise infrastructure to support income generation and tourism development

The LRS project plans to fund construction of a limited quantity of enterprise infrastructure in targeted communities in the SRS. In all cases, the project will support the planning of infrastructure types and the piloting of specific infrastructure units as models to be replicated with funding and support from non-project sources. Following are brief descriptions of the types of enterprise infrastructure planned and the general locations envisioned.

Upgrading Local Fishing Boats for Tourist Use

There exists already a nascent demand by tourists short excursions into the waters of Sharm Luliyyah and Qul'an Bay. However, in order to capitalize on existing demand and spur increased demand, it is necessary to improve the facilities aboard existing fishing boats to (a) guarantee the safety of tourists and crew and (b) provide the amenities tourists expect (e.g. comfortable seating, viewing areas, glass bottoms for undersea viewing, food preparation and potable water storage). The LRS project will fund the improvement of 2-3 fishing boats on a pilot basis.

Handicrafts and Visitors Center

In order to catalyze enterprise development in El Shelateen, the LRS project will fund construction of a building to house handicraft makers and sellers, and to provide information to tourists visiting the city. The building would be constructed on a concrete slab with a footprint not to exceed 100 m². The building would be single story, with water supply, flush toilets and electricity. Water supply would come from a rooftop tank. Sewage would be collected in an underground concrete septic tank constructed next to the building. The septic tank and drainage field would be constructed using best engineering practices, including:

- Septic Tank: Built from concrete and completely sealed, except for the outlet pipe to the drainage field
- Septic Tank: Capacity of no less than 3,000 liters per household
- Drainage Field: At least 100 feet from drinking water sources
- Drainage Field: Slope drainage field away from houses, buildings and any water supply
- Drainage Field: Keep drainage field unshaded and free from trees and shrubbery
- Drainage Field: Allow sufficient space to enlarge the drainage field if it should become necessary
- Drainage Field: Keep septic tanks or drainage field uncovered by driveways or concrete
- Septic Tanks and Drainage Fields: Locate septic tanks and drainfields away from drainage areas and water-ways (the system should be a minimum of 500 m from the Red Sea The septic tank would be emptied by truck on a regular basis.

The general location planned for this intervention is El Shelateen.

Planning of Camel Market and Commercial Market

The existing camel market and commercial market in El Shelateen are relatively effective as venues basic commerce, but neither one is attractive as a tourist destination. However, if these markets were re-planned to organize their activities more efficiently and to provide access to tourist facilities such as shops, cafeterias, public toilets and lodging, they would be an attractive destination for tourists visiting the SRS. The LRS project will not fund construction of any facilities associated with this work. The project's activities would be limited to technical assistance targeted at the Planning of the two markets.

4.2 Park Infrastructure and Basic Facilities

WGNP is in its infancy as a *bona fide* destination for visitors. While the RSP has made great strides in terms of increasing ranger presence in the park and improving the overall management of the park's resources, WGNP lacks the basic infrastructure and facilities to provide visitors with a safe and enriching experience and to allow the RSP to effectively management the park's resources over the long term. The LRS project therefore plans to fund the design and construction of basic infrastructure that will provide the foundation for increased quality and quantity of visitor experience and more effective park management. Following are brief descriptions of the physical interventions planned, divided into two subcategories:

- Park Management Infrastructure
- Park Visitation Infrastructure

4.21 Park Management Facilities

Ranger Outposts

In order to effectively monitoring and manage visitor activities in the Park, it is necessary for the park rangers to have a semi-permanent presence at key locations with its borders. The park



currently has three operational ranger outposts located at strategic locations within the park. The LRS project plans to fund construction of two additional ranger outposts to create a more effective management network.

These outposts will be constructed using the same design at the existing three outposts. The outposts are constructed using local stone to match the ancient Roman ruins in the area (e.g. Sikait), with minimal amounts concrete mortar and imported wood. The outposts are constructed on leveled ground but without any slab foundation. Each outpost includes a sleeping and work area, plus a separate

Figure 4.4: Ranger Outpost

kitchen building and a separate non-flushing pit latrine. These non-flushing latrines would serve the needs of rangers stationed at the outpost and any visitors to the outpost. Each latrine would be built from the same local stone at the other outpost buildings, and include a concrete slab foundation not to exceed 2.5 m², a PVC vent pipe, and a cement-lined fully sealed septic tank (i.e. closed system with no drainage field) with a depth not to exceed 2 m.

These outposts will be constructed using the same design at the existing three outposts. The outposts are constructed using local stone to match the ancient Roman ruins in the area (e.g. Sikait), with minimal amounts concrete mortar and imported wood. The outposts are constructed on leveled ground but without any slab foundation. Each outpost includes a sleeping and work area, plus a separate kitchen building and a separate pit latrine. The outposts are built on rises above wadis or other major transportation corridors to provide rangers with a view of the surrounding area and access to transport the park's internal transport network. Each output also includes a covered car park to provide shaded space for two ranger vehicles. The car parks are made from imported or non-native wood and other vegetation. The outposts are equipped with solar photovoltaic (PV) arrays to provide minimal electric power and with a small water tank that is refilled by the rangers when they visit the outpost. Each outpost has a total footprint of approximately 30 m².

Community Guard Post

The RSP employs local Bedouin as community guards throughout WGNP. Community guards supplement the monitoring capacity of the park rangers, alerting rangers to activities they observe within the park and participating in the RSP's ongoing park management activities. The LRS project plans to fund construction of a rustic shelter for community guards located at Ras Baghdadi to provide shade and protection from the elements. The community guard post will be constructed of non-native wood and thatch with an approximate area of 9m². It will not be equipped with any other services.

WGNP Headquarters

The RSP is headquartered in Hurghada, some 300+ km north of WGNP's northern border. The RSP also has a permanent ranger presence in two ranger stations at the WGNP borders. One station at the northern coastal border about 50 m south of the Shams Alam resort and one at the southern coast border, just north of Hamatah. These ranger stations, which include work and accommodation space, serve the daily operational needs of the rangers working in the park. However, they do not serve the broader administrative function for park operations. This function largely goes unmet at this time.

Having a central location for park administration, coordination and planning would significantly improve overall park operation and management. Therefore the LRS project plans to provide funding to plan and design an administrative headquarters located in the village of Abu Ghusun, which is approximately in the middle of WGNP, north to south and along the coast. It is possible that the LRS project also will fund a minority percentage, likely no more than 20%, of the headquarters construction in addition to doing the planning and design. No planning or detail work has yet been done for the proposed WGNP headquarters building, but the building and related facilities and grounds would occupy a site of approximately 6,000 m². The building

would accommodate a staff of approximately 40 people. The building itself would be constructed on a slab, using reinforced concrete and brick. The building likely would be two stories high. It would be equipped with all basic facilities including water supply, sewerage and electricity. Sewage would drain into a septic tank constructed on concrete and emptied by truck on a regular basis. The septic tanks and drainage fields would be constructed using best engineering practices, including:

- Septic Tank: Built from concrete and completely sealed, except for the outlet pipe to the drainage field
- Septic Tank: Capacity of no less than 500 liters per person
- Drainage Field: At least 100 feet from drinking water sources
- Drainage Field: Slope drainage field away from houses, buildings and any water supply
- Drainage Field: Keep drainage field unshaded and free from trees and shrubbery
- Drainage Field: Allow sufficient space to enlarge the drainage field if it should become necessary
- Drainage Field: Keep septic tanks or drainage field uncovered by driveways or concrete
- Septic Tanks and Drainage Fields: Locate septic tanks and drainfields away from drainage areas and waterways (the system should be a minimum of 500 m from the Red Sea)

4.22 Park Visitation Facilities

Solar Power Generation Systems

Because most of the SRS is not connected to the national electric power grid, some communities and remote areas do not have any access to electricity. The LRS project plans to procure and install several pilot solar PV systems, including solar panels, inverters, chargers and distribution wiring in targeted areas within WGNP. The systems will provide minimal electricity to power low voltage applications, such as lights. The general locations planned for these interventions include Qul'an Bay, Sikait, and possibly another location in WGNP. These systems will be similar to those currently installed at three operational ranger outposts in WGNP and proposed for the two additional ranger outposts that the LRS project plans to construct.

Elevated Pedestrian Boardwalk

The LRS project concept for Qul'an Bay is to create as little impact on this unique and ecologically sensitive resource as possible while making it an attractive tourist day visit destination. Tourists already visit Qul'an on their own or with tour operators, but these visits are unmanaged and detrimental to the area's fragile natural assets. To accommodate walking along the Bay's long headland above the beach, the LRS project plans to construct an elevated boardwalk to keep visitors away from the edge of the headland. The soil the comprises the headland is unstable and subject to slumping at its edge. This presents a safety hazard as well as causing erosion of the headland onto the beach and mangroves below. The planned elevated boardwalk would be constructed from non-native wood, with pilings set in concrete to secure it

to the ground. The boardwalk would be constructed in phases, with an eventual length of approximately 1,000 linear meters.

Nature Trails

To control visitor access to the sensitive ecological areas at targeted locations, the LRS project plans to develop nature trails. These trails would be constructed using rope and stakes to create boundaries within which visitors' movement would be restricted. The general locations planned for these interventions are Wadi el Gimal Island, Sharm Luliyah, Qul'an Bay and Ras Baghdadi.

Vehicle Access Route Demarcation

WGNP has a network of existing vehicle access trails that begin at various points along the coastal highway and generally follow the wadis west into the park's hinterlands. However, some visitors also create their own trails or drive parallel to existing trails, creating additional routes, disrupting vegetation and wildlife and creating safety hazards for themselves and others. In order to control the routes that visitors take within the park, the LRS project plans to demarcate the major existing trails. These route will link major points of interest within the park and will be receive signage as well. The demarcation will entail placement of small stones from the immediate area along the perimeter of the trails. No grading or other improvement will be made. The LRS project plans to demarcate approximately 70 km of trails throughout WGNP, primarily in the parks desert area. Short stretches of trails also are planned to be demarcated at Qul'an Bay, Sharm Luliyah and at the camel market in El Shelateen.

Hiking Trail Demarcation

As with the vehicle trails, WGNP has an existing network of hiking trails. These are used both by park visitors and by local Bedouin who traverse the park. The LRS project plans to demarcate this existing trail network to control visitor access to the park's fragile natural assets. Trail demarcation will include placement of stones from the immediate area at the perimeter of the trails and the addition of signage. No construction will be undertaken as part of this demarcation. The project plans to demarcate approximately 50 km of hiking trails throughout the interior (i.e. desert) areas of WGNP.

Car Parks

Currently visitors to WGNP's various points of interest park informally wherever they choose. Often this means they park on the side of the coastal highway, creating a safety hazard for themselves and others, in ecologically fragile areas, damaging local vegetation, on unstable ground, getting their vehicles stranded or in other inappropriate areas. The LRS project plans to develop several car parks in strategic locations throughout WGNP to reduce these problems. These car parks will not entail any construction of paving work. The work will be limited to grading of the parking areas and demarcation of the parking area boundaries. Each parking area will be a maximum of 2000m². The general locations planned for these interventions include Qul'an Bay, Sharm Luliyah and Ras Baghdadi.

Camel Yard

Camel riding is a popular tourist activity throughout much of Egypt. The LRS project plans to fund construction of a small camel yard at Ras Hunkurab where local people can pen their

camels for hiring by tourists. The pen would be constructed from imported wood to accommodate a maximum of 12 animals. The pen would have a footprint not to exceed 80 m². All fodder for the camels would be imports (i.e. non-native vegetation).

Interpretive Signs

WGNP currently has extremely limited signage, both at entry points and within the parks boundaries. In order to attract visitors, and to help ensure their safety and manage their movement within the park, signage is necessary. The LRS project plans to develop a comprehensive signage program that include planning, design, implementation and maintenance of signage throughout the park. The signage itself will be produced locally using local materials to the extent practicable. Areas that will specifically targeted for signage because of their high value as visitor attractions include Wadi el Gimal Island, Sharm Luliyah, Qul'an Bay and Sikait.



Figure 4.5: Sign at WGNP entry point

Campgrounds

Currently there are no designated campgrounds within the WGNP borders. To the extent that visitors are making overnight stays in the park, they are free to camp wherever they decide regardless of the appropriateness of the site selected. In order to better manage future oversight stays to the park and provide a crucial amenity that international visitors expect in a national park, the LRS project plans to fund establishment of two campgrounds within the park's boundaries – one at the ancient Roman emerald mining site of Sikait and one at the coastal site of Sharm Luliyah (west of the coastal highway). The funding for these interventions would include site planning and design of the campgrounds, leveling of the area for the campgrounds if necessary), demarcation of the campgrounds and specific campsites, and minimal signage. No utilities or other amenities are planned.

Installation of Mooring Buoys at SRS Dive Sites



Figure 4.6: Installation of Mooring Buoys

Egypt has made tremendous strides in the management of off-shore diving sites through the establishment and maintenance of a comprehensive mooring buoy program through most of its near shore Red Sea territory. In fact, Egypt now has more than 1,000 mooring buoys in place. However, mooring buoy coverage in the SRS remains relatively limited, particularly at key locations that are likely to receive substantially increased levels of tourist activities in the coming years. Therefore the LRS project intend to fund the establishment of mooring buoys off shore at Sharm Luliyah, Qul'an Bay and Wadi el Gimal Island.

Planting Native Vegetation

In order to create a more aesthetically appealing environment for visitors and to help stabilize the soil in the area, the LRS project intends to fund procurement and planting of native trees and scrubs at Sharm Luliyah. The number and types of trees and scrubs is to be determined after more detailed planning.

Rehabilitation of Natural Vegetation

Ras Baghdadi is a unique ecological area located at the outlet of Wadi el Gimal along the coast within WGNP. The area has a substantial mangrove stand that is unique for that stretch of the SRS coast. This mangrove stand has been degraded in recent years by camel grazing and other overuse of the resource. In concert with a RSP ranger led mangrove management plan, the LRS project will fund rehabilitation of the mangroves at Ras Baghdadi, including transplant of mangrove trees from established nurseries.

Bird Watching and Observation Platforms

Bird watching has become a worldwide phenomenon in terms of its popularity. The SRS has a number of rare and exotic bird species that already attract both Egyptian and international tourists to the area. However, these visits are in large part unmanaged currently, creating the potential for serious damage to the fragile natural habitats of these unique resources. Three coastal areas, in particular, are thriving and critical habitat for local birds – Wadi el Gimal Island, Qul'an Bay and Ras Baghdadi. In order to help the RSP better manage bird watching and other visits to these sensitive areas, the LRS project plans to fund construction of platforms to provide visitors with good vantage points from which to observe and photograph birds and fauna, while minimizing intrusion and degradation of these fragile ecosystems. The planned platforms would be built from non-native wood, with the height of the platform depending on its location, but not to exceed 3m. Each platform would be built to accommodate approximated eight people at a time. The LRS project plans to construct approximately six platforms total at these three locations.

Beach Park Facilities

Currently there are no visitor facilities in WGNP. Because much of the terrestrial (desert) areas of the park are extremely remote, the need to construct facilities to support visits is not yet critical. However, the coastal locations within the park are easily accessible from the coastal highway, which generally is no more than 500m shoreline. Therefore, constructing facilities to manage the impact of current visitation levels and catalyze increased visitation, the LRS project plans to fund procurement and construction of basic infrastructure including snack bars, beach parasols, park benches and shaded areas. All of these planned interventions will be implemented as part of an overall park infrastructure planning exercise to determine the best placement of facilities and the best systems for operation and management of the facilities themselves. Snack bars would be built of concrete and brick, with concrete slab foundations not to exceed 4m². A maximum of four snack bars is planned (one per location). Park benches would be constructed from poured concrete. Each bench would be placed on a concrete slab foundation not to exceed 1.5m² per bench. A maximum of 20 benches is planned. Parasols and shaded areas would be constructed from non-native wood and other vegetation (e.g. thatch). The numbers for each are

to be determined based on specific site requirements. The general locations planned for these interventions include Wadi el Gimal Island, Qul'an Bay, Sharm Luliyah and Ras Baghdadi.

Pit Latrines at Beaches

As with other park visitor facilities, there are no public toilets currently located within WGNP. In order to manage the current and increasing park visitation and provide the basic services needed to attract park visitors, the LRS project plans to fund construction of non-flushing latrines at key coastal location that currently attract visitors and that likely will attract increasing numbers of visitors as the park becomes a more popular destination. Approximately six non-flushing pit latrines would be constructed at each location (three for male visitors and three for female visitors), with the six non-flushing pit latrines housed in a single building separated for male and female visitors. Each building would be constructed on a concrete slab foundation not to exceed 10 m². The building itself would be constructed of concrete and brick. Each building would be equipped with a potable water supply (trucked water to be stored in a water tank on the roof of each building) to supply faucets within the building. Waste from each toilet would be collected in an underground sealed septic tank next to the building. The septic tank would be constructed on concrete with an approximate capacity of 3,000 liters. The septic tanks would be emptied by truck on a regular basis. These locations include Wadi el Gimal Island, Sharm Luliyah and Qul'an Bay.

Section Five: Potential Environmental Impacts

The PEA team identified a set of significant environmental issues and associated environmental impacts for each type of planned physical intervention in the LRS Scoping Statement.

Descriptions of each type of intervention have been provided in *Section Four, Description of Proposed Activities*. In this section, the PEA team assesses the potential environmental impacts associated with each type of planned physical intervention to determine which impacts are significant⁴. A summary list that aggregates all impacts identified by the PEA team follows.

Biological Impacts

- Destruction of vegetation
- Stress on native wildlife
- Damage to coral reefs (from sedimentation)

Physical and Chemical Impacts

- Surface Water: Biological contamination/eutrophication
- Surface Water: Increased turbidity (from soil erosion)
- Soil: Increased sedimentation (from soil erosion)
- Soil: Contamination
- Air: Increased airborne particulates
- Odor: Noxious odors
- Noise: Increased noise levels
- Views: Views obstructed/Aesthetic quality diminished

Social and Cultural Impacts

- Unhealthy and/or unsafe working conditions
- Unhealthy and/or unsafe conditions for local residents
- Destruction and/or interference with traditional cultural practices
- Interference with social and/or economic livelihoods
- Disruption or damage to archeological sites or artifacts

A separate table is provided for each planned physical intervention. *Only those impacts linked to a specific planned physical intervention during the scoping process are included in the table for that specific intervention. Those impacts not linked to a specific planned physical intervention are not included in the table for that intervention.* The PEA team assesses the impacts in the construction and operational phases for each planned type of physical intervention.

In many cases the planned intervention very likely would have a *positive* environmental impact. However, the PEA team takes a conservative approach to impact assessment, identifying the potential for significant *negative* environmental impact if the planning, design, construction and operation of each intervention is not undertaken responsibly, employing best practices relevant to

⁴ In the parlance of USAID's environmental procedure, it is important to distinguish between significant environmental *issues* identified in the Scoping Statement and significant environmental *impacts* identified during the PEA. Significant issues are those deemed to have the potential to result in environmental impacts. Those impacts are the ones that are carried forward for assessment from the Scoping Statement to the PEA itself to determine whether the impacts are significant.

each intervention. For example, many of the significant impacts identified in this section relate to water. They relate to the potential for surface water and groundwater contamination. They relate to the erosion and sedimentation of soil by water. In practical terms, negative impacts related to water are unlikely, given (a) rainfall in the project area is extremely limited (i.e. approximately 25 mm per year), (b) there are no surface water bodies in the project areas, except the Red Sea, and (c) there are no groundwater resources in the project area that are drawn down for potable water use.

However, given the extreme fragility of the ecosystems in the project area and the paramount necessity not to compromise their integrity because they are the driver for economic growth in the region, the PEA team errs on the side of caution in its assessment of impacts. The team therefore makes a finding of *significant* with respect to impacts that very likely will not present a problem, particularly given that a set of best practices will be implemented to mitigate any potential for negative impacts. Those best practices will be addressed using a set of mitigation measures. These mitigation measures are presented in Section Six, *Recommended mitigation measures*. Mitigation measures are linked to each impact and to each planned physical intervention.

The PEA team takes special notice of the social and cultural impacts associated with the planned physical interventions. In the case of the LRS project, no major construction activities are planned that would displace large numbers of households. In addition, the LRS project is committed to using a participatory approach to intervention planning that involves community residents in all phases of the development process. However, the potential still exists for the social, cultural and economic livelihoods of residents in targeted communities to be disrupted by planned physical interventions. It is therefore critical that the opinions and the needs of residents are fully considered and integrated into final plans.

In particular, relocation of homes, shops and other vital community facilities should be avoided. The experience of USAID, the World Bank and other bilateral and multilateral development agencies has demonstrated that relocation (or resettlement as it is typically termed), often have unintended negative impacts, even when residents voluntarily agree to these changes.

Impacts from Planned Resort Development

The potential secondary environmental impacts associated with the additional hotel rooms and other tourism facilities planned for construction in the southern Red Sea region are significant. These plans were summarized in Table 3.1. However, these activities are not directly or indirectly attributable to the planned LRS interventions. TDA's current and future plans for selling land to developers who in turn plan to build resort facilities are independent of specific LRS interventions. LRS physical interventions, specifically those planned for WGNP, are intended to eliminate or minimize the negative environmental impacts that likely would otherwise result from the increased number of tourists who will visit the WGNP in the coming years. These tourist visits are made possible, in large part, by the increased number of hotels and associated tourism infrastructure currently being constructed and planned by TDA. The LRS project has overtly planned the nature and scope of its planned physical interventions in WGNP to address the potential impacts of this new development. Planning LRS interventions for WGNP

will significantly increase the Park's capacity to handle increased visitation (e.g. carrying capacity).

5.1 Community Development Infrastructure

As discussed in Section Four, physical interventions supporting community development are divided into two subcategories:

- Basic infrastructure to support day to day life
- Enterprise infrastructure to support income generation and tourism development

5.11 Basic infrastructure to support daily life

The LRS project plans to fund construction of a limited quantity of basic infrastructure in targeted communities in the SRS. In all cases, the project will support the planning of infrastructure types and the piloting of specific infrastructure units as models to be replicated with funding and support from non-project sources.

Community Self-Help Centers

These centers would serve as gathering space for community activities. The specific uses of the centers would be decided by the community, and likely would include basic education, health clinic space, meeting space, space for other small community services. The buildings would be constructed of brick and concrete, on a concrete slab foundation with a footprint not to exceed 50 m². No water supply sewerage or electricity are planned. The planned general locations for these interventions include Qul'an Bay and Hamatah.

Table 5.1: Community Self-Help Centers

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.
Stress on native wildlife	✓		Not Significant. The locations planned are already populated human settlements. No increase in population or human activity will result from the planned interventions.
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			
Surface Water: Increased turbidity (from soil erosion)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation (from soil erosion)	✓		Significant. Construction activities can increase erosion which causes sedimentation.
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Noise: Increased noise levels	✓		<i>Significant.</i> Construction activities create noise that can interfere with community activities in the immediate area.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	<i>Significant.</i> Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		<i>Significant.</i> Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	<i>Significant.</i> Lack of safety procedures and/or equipment can result in accidents and injuries to local residents.
Destruction and/or interference with traditional cultural practices		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	<i>Significant.</i> Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

Sanitary Pit Latrines at Beaches

These non-flushing latrines would serve the needs of local residents in targeted communities who currently have no sanitary facilities available. Each latrine would include a brick and mortar housing, a concrete slab foundation not to exceed 2.5 m², a PVC vent pipe, and a cement-lined fully sealed septic tank (i.e. closed system with no drainage field) with a depth not to exceed 3 m. Approximately eight latrines are planned. The septic tanks would be emptied on a regular basis by trucks. The planned general locations for these interventions include Sharm Luliyah and Qul'an Bay.

Table 5.2: Sanitary Latrines with Septic Tanks at Beaches

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.
Stress on native wildlife	✓		Not Significant. The locations planned are already populated human settlements. No increase in population or human activity will result from the planned interventions.
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			

Category/Impact	Project Phase		Significance
	Construction	Operation	
Surface Water: Biological contamination/eutrophication		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.
Soil: Contamination		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

Fresh Water Tanks and Standpipes

Because there are no local groundwater or surface water resources in SRS coastal areas, residents rely on trucked water for their basic needs. This water is however expensive and of inconsistent quality. Water tanks would be placed on the roofs of existing buildings in the community or on the roofs of building to be constructed by LRS (e.g. community self-help centers). The tanks would be prefabricated polyurethane with an estimated volume of 2000 liters. The tanks would include basic PVC piping to communal standpipes. The planned general locations for these interventions include Sharm Luliyah and Qul'an Bay.

Table 5.3: Fresh Water Tanks and Standpipes

Category/Impact	Project Phase		Significance
	Construction	Operation	
Physical and Chemical			
Views: Views obstructed/Aesthetic quality diminished		✓	Significant. Poor siting of tanks can obstruct scenic views of the Red Sea and other local resources.

Replacement or Provision of Power Generators

The electric power grid does not serve many small coastal communities in the SRS. The LRS project will procure and install a small diesel powered generator to serve the basic electricity needs of residents currently living in the area around Qul'an Bay. The generator will have an estimated generation capacity of 20kW. The generator and fuel tank will be located on a concrete slab not to exceed 4 m². The project might also purchase and install a larger diesel power generator for use in the village of Hamatah. This generator would have an estimated generation capacity of 800 kW. This generator would be housed in a self-contained structure built on a concrete slab and made of bricks and concrete. The generator would be set apart from housing and other community structures. The planned general locations for these two separate interventions are Qul'an Bay and Hamatah, respectively.

Table 5.4: Replacement or Provision of Power Generators

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.
Stress on native wildlife		✓	Significant. Although the locations planned are already populated human settlements, increased noise levels from generators could disrupt wildlife in the area.
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.
Air: Increased airborne particulates	✓	✓	Significant. (1) Construction activities create dust that reduces air quality in the immediate area; (2) Diesel generator exhaust creates airborne particulates in the immediate area
Noise: Increased noise levels	✓	✓	Significant. Construction activities and operation of diesel generators create noise that can interfere with community activities in the immediate area.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) can send diesel fumes into populated areas.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of generators can obstruct scenic views of the Red Sea and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to local residents. Special precautions are needed in the vicinity of fuel tanks.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.

Upgrading and/or Restoration of Fishermen Houses or Other Informal Housing Units

The 17 families now resident at Qul'an Bay live in improvised shacks made from scrap wood and other materials with no sanitary services. The primary purpose for improving their dwellings is to improve their living conditions. The second purpose is to improve the overall aesthetic quality of the area as a tourist destination. Increased tourism will benefit the local residents directly by bringing customers to existing local enterprises and providing the locals with incentive to invest in additional enterprises. The housing work planned would be limited to existing structures. No new structures would be built. No water supply or toilet facilities are planned. Wood and other locally available materials would be used. The planned general location for this intervention is Qul'an Bay.

Table 5.5: Upgrading and/or Restoration of Fishermen Houses or Other Informal Housing Units

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Not Significant. Construction will be on existing houses only. No new houses or other buildings will be constructed, so no new land will be disturbed.
Stress on native wildlife	✓		Not Significant. The locations planned are already occupied by existing houses.
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Soil: Increased sedimentation	✓		<i>Significant.</i> Construction activities can increase erosion which causes sedimentation.
Air: Increased airborne particulates	✓		<i>Significant.</i> Construction activities create dust that reduces air quality in the immediate area.
Noise: Increased noise levels	✓		<i>Significant.</i> Construction activities create noise that can interfere with community activities in the immediate area.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	<i>Not Significant.</i> Construction will be on existing houses only. No new houses or other buildings will be constructed, so no new obstructions to views will occur.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		<i>Significant.</i> Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓		<i>Significant.</i> Lack of safety procedures and/or equipment can result in accidents and injuries to local residents
Destruction and/or interference with traditional cultural practices		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.

Construction of Model Houses for Bedouin Fishermen and Other Local Inhabitants

The LRS project plans to construct no more than 10 housing units with a maximum footprint of 120 m² per unit. These units would be part of a larger development plan the LRS project has proposed. The buildings would be constructed on a concrete slab, with the building itself made from bricks and concrete. Each house would include water supply (roof tanks) and a flushing toilet connected to a septic tank (shared by several houses) and drainage field, both with necessary piping. The septic tanks and drainage fields would be constructed using best engineering practices, including:

- Septic Tank: Built from concrete and completely sealed, except for the outlet pipe to the drainage field
- Septic Tank: Capacity of no less than 3,000 liters per household
- Drainage Field: At least 100 feet from drinking water sources
- Drainage Field: Slope drainage field away from houses, buildings and any water supply
- Drainage Field: Keep drainage field unshaded and free from trees and shrubbery
- Drainage Field: Allow sufficient space to enlarge the drainage field if it should become necessary
- Drainage Field: Keep septic tanks or drainage field uncovered by driveways or concrete
- Septic Tanks and Drainage Fields: Locate septic tanks and drainfields away from drainage areas and water-ways (the system should be a minimum of 500 m from the Red Sea shoreline).

The planned general location for this intervention is Hamatah.

Table 5.6: Construction of Model Houses for Bedouin Fishermen and Other Local Inhabitants

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.
Stress on native wildlife	✓		Not Significant. The locations planned are already populated human settlements. No increase in population or human activity will result from the planned interventions.
Damage to coral reefs (from sedimentation)	✓		Significant. Although all planned construction will be on the west side of the coastal highway, sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			
Surface Water: Biological contamination/eutrophication		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Although all planned construction will be on the west side of the coastal highway, sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation	✓		Significant. Although all planned construction will be on the west side of the coastal highway, construction activities can increase erosion which causes sedimentation.
Soil: Contamination		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

Material Recovery Facilities and Small Solid Waste Disposal Facilities

The LRS project plans to support the establishment and/or operation of several solid waste management (SWM) facilities. These facilities would in some cases be used for collection, sorting and recycling of materials. In this case, they are termed Material Recovery Facilities (MRFs). Such facilities are only practical when the waste stream entering the facility is primarily or entirely non-organics, completely non-hazardous and comprised of materials for which there is an established wholesale market. The waste stream from resort facilities (minus the food waste), meets these criteria. Specific descriptions of LRS support to each planned facility follows:

- **Shagra IDC** – The LRS project plans to support the establishment of an MRF in the proximity of the Shagra Integrated Development Center or IDC,. The site is located about 2 km southwest of Marsa Alam and about 16 km south of the Shagra IDC. The 4,000 m² site is located in the existing Marsa Alam industrial zone will receive waste primarily from the Shagra IDC. The activity is being led by a prominent Non-Governmental Organization (NGO) in the SRS called the Hurghada Environmental Protection and Conservation Association (HEPCA). The LRS funding will be limited to procurement of equipment for the MRF and technical assistance and training for the MRF management and staff. No LRS funds will be used for construction of facilities associated with the MRF.
- **Shams Alam** – This small MRF, located on the west side of the coastal highway and adjacent to the Shams Alam resort, was established with funds from a previous USAID-funded program called the Egyptian Environmental Policy Program (EEPP). The LRS project will not fund construction of any facilities at the site. LRS assistance is limited to ongoing technical assistance and training for the facility, and procurement of manual compactor for compacting aluminum, plastic and paper prior to transport.
- **Hamatah** – The LRS project plans to provide funding to plan and construct a small waste sorting facility (not a full MRF) on approximately 100 m² of land to the west of the coastal highway in Hamatah. The facility will include a steel fenced perimeter enclosing the entire site. The site will be graded to make it level. Inside the perimeter no permanent structures

will be built. There will be several covered areas made from wood and canvas to provide shade for the employees. There will be equipment on site to sort and process recyclable materials. No solid waste will be kept permanently at the site.

- El Shelateen – There currently is not formal SWM facility in El Shelateen. Solid waste is dumped in a number of sites throughout the municipality, with the largest such site being an informal landfill covering approximately 1,000 m² on the outskirts of the town, near the commercial market. Because there is a large camel market in El Shelateen, animal carcasses also are dumped in the informal landfill. This creates an extremely unsanitary situation, with flies and other disease carries insects attracted to the site. As part of a larger redevelopment plan for El Shelateen, the LRS project plans to construct a number of small SWM facilities, with waste segregated by type. All of these facilities (maximum of three total) will be fenced and include the equipment necessary to process recyclable materials. A separate landfill will be constructed to handle the animal waste from the camel market.

Table 5.7: Material Recovery Facilities and Small Solid Waste Disposal Facilities

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.
Stress on native wildlife	✓	✓	Significant. The locations planned are already populated human settlements. However: (1) The size of the planned Shagra MRF calls for careful planning to avoid any micro-habitats for local wildlife; (2) It is important that wildlife not gain access to any organic matter disposed temporarily or permanently at any planned sites. Ingesting human food waste might damage their systems and/or disrupt their normal feeding patterns.
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.
Soil: Soil Contamination		✓	Not Significant. Solid waste handled by planned facilities will not include hazardous or toxic substances. Also, the limited precipitation in the area minimizes the risk of soil absorption and transport of any substances handled by the facilities.
Air: Increased airborne particulates	✓	✓	Significant. (1) Construction: Construction activities create dust that reduces air quality in the immediate area; (2) Operation: Truck traffic to/from SWM facilities on unpaved roads creates dust that reduces air quality in the immediate area

Category/Impact	Project Phase		Significance
	Construction	Operation	
Noise: Increased noise levels	✓	✓	Significant. (1) Construction: Construction activities create noise that can interfere with community activities in the immediate area; (2) Operation: SWM facility activities and truck traffic to/from SWM facilities creates noise can interfere with community activities in the immediate area
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) of SWM facilities in which organic waste in temporarily or permanently disposed can cause noxious odors.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of structures (e.g. fencing, equipment) can obstruct scenic views of the Red Sea and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper disposal of organic waste attracts flies and other disease vectors
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

5.12 Enterprise infrastructure to support income generation and tourism development

The LRS project plans to fund construction of a limited quantity of enterprise infrastructure in targeted communities in the SRS. In all cases, the project will support the planning of infrastructure types and the piloting of specific infrastructure units as models to be replicated with funding and support from non-project sources. Following are brief descriptions of the types of enterprise infrastructure planned and the general locations envisioned.

Upgrading Local Fishing Boats for Tourist Use

There exists already a nascent demand by tourists short excursions into the waters of Sharm Luliyah and Qul'an Bay. However, in order to capitalize on existing demand and spur increased demand, it is necessary to improve the facilities aboard existing fishing boats to (a) guarantee the safety of tourists and crew and (b) provide the amenities tourists expect (e.g. comfortable

seating, viewing areas, glass bottoms for undersea viewing, food preparation and potable water storage). The LRS project will fund the improvement of 2-3 fishing boats on a pilot basis.

Table 5.8: Upgrading Local Fishing Boats for Tourist Use

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Damage to coral reefs (from sedimentation)		✓	Significant. Improper operation of tourist boats along sensitive coral reefs can create damage to the coral including (a) anchor damage to reefs; (b) boat collisions with reef; (c) disposal of solid waste on or near reefs.
Social and Cultural			
Unhealthy and/or unsafe working conditions		✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to crew and passengers on the boats, and to swimmers, snorkelers and divers in the water.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design and/or operation of tourist boats could conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate operation of tourist boats could conflict with social and/or economic livelihoods.

Handicrafts and Visitors Center

In order to catalyze enterprise development in El Shelateen, the LRS project will fund construction of a building to house handicraft makers and sellers, and to provide information to tourists visiting the city. The building would be constructed on a concrete slab with a footprint not to exceed 100 m². The building would be single story, with water supply, flush toilets and electricity. Water supply would come from a rooftop tank. Sewage would be collected in an underground concrete septic tank constructed next to the building. The septic tank and drainage field would be constructed using best engineering practices, including:

- Septic Tank: Built from concrete and completely sealed, except for the outlet pipe to the drainage field
- Septic Tank: Capacity of no less than 3,000 liters per household
- Drainage Field: At least 100 feet from drinking water sources
- Drainage Field: Slope drainage field away from houses, buildings and any water supply
- Drainage Field: Keep drainage field unshaded and free from trees and shrubbery
- Drainage Field: Allow sufficient space to enlarge the drainage field if it should become necessary
- Drainage Field: Keep septic tanks or drainage field uncovered by driveways or concrete
- Septic Tanks and Drainage Fields: Locate septic tanks and drainfields away from drainage areas and water-ways (the system should be a minimum of 500 m from the Red Sea The septic tank would be emptied by truck on a regular basis.

The general location planned for this intervention is El Shelateen.

Table 5.9: Handicrafts and Visitors Center

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Although the site that likely will be selected for construction is devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.
Stress on native wildlife	✓		Not Significant. Any location selected would be in a populated human settlement.
Damage to coral reefs (from sedimentation)	✓		Significant. Although all planned construction would be a minimum of one kilometer from the Red Sea, sedimentation from construction could potentially run off into the Red Sea coastal waters in a significant flash flood event, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			
Surface Water: Biological contamination/eutrophication		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Although all planned construction would be a minimum of one kilometer from the Red Sea, sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation	✓		Significant. Although all planned construction would be a minimum of one kilometer from the Red Sea, construction activities can increase erosion which causes sedimentation.
Soil: Contamination		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

Planning of Camel Market and Commercial Market

The existing camel market and commercial market in El Shelateen are relatively effective as venues basic commerce, but neither one is attractive as a tourist destination. However, if these markets were re-planned to organize their activities more efficiently and to provide access to tourist facilities such as shops, cafeterias, public toilets and lodging, they would be an attractive destination for tourists visiting the SRS. The LRS project will not fund construction of any facilities associated with this work. The project's activities would be limited to technical assistance targeted at the Planning of the two markets.

Table 5.10: Planning of Camel Market and Commercial Market

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. It is possible that vegetation could be located on one or more sites for targeted interventions and therefore vegetation could be disrupted during construction.
Stress on native wildlife	✓		Not Significant. Any location selected for construction would be in a populated human settlement.
Damage to coral reefs (from sedimentation)	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities and all planned construction would be a minimum of one kilometer from the Red Sea, sedimentation from construction could potentially run off into the Red Sea coastal waters in a significant flash flood event, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			

Category/Impact	Project Phase		Significance
	Construction	Operation	
Surface Water: Biological contamination/eutrophication		✓	Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Any septic tanks and drainage fields constructed must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities and all planned construction would be a minimum of one kilometer from the Red Sea, sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities and all planned construction would be a minimum of one kilometer from the Red Sea, construction activities can increase erosion which causes sedimentation.
Soil: Contamination		✓	Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Any septic tanks and drainage fields constructed must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea
Air: Increased airborne particulates	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Construction activities create dust that reduces air quality in the immediate area.
Noise: Increased noise levels	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Construction activities create noise that can interfere with community activities in the immediate area.
Odor: Noxious odors		✓	Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities, inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.
Destruction and/or interference with traditional cultural practices		✓	Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

5.2 Park Infrastructure and Basic Facilities

WGNP is in its infancy as a *bona fide* destination for visitors. While the RSP has made great strides in terms of increasing ranger presence in the park and improving the overall management of the park's resources, WGNP lacks the basic infrastructure and facilities to provide visitors with a safe and enriching experience and to allow the RSP to effectively management the park's resources over the long term. The LRS project therefore plans to fund the design and construction of basic infrastructure that will provide the foundation for increased quality and quantity of visitor experience and more effective park management. Following are brief descriptions of the physical interventions planned, divided into two subcategories:

- Park Management Infrastructure
- Park Visitation Infrastructure

5.21 Park Management Facilities

Ranger Outposts

In order to effectively monitoring and manage visitor activities in the Park, it is necessary for the park rangers to have a semi-permanent presence at key locations with its borders. The park currently has three operational ranger outposts located at strategic locations within the park. The LRS project plans to fund construction of two additional ranger outposts to create a more effective management network.

These outposts will be constructed using the same design at the existing three outposts. The outposts are constructed using local stone to match the ancient Roman ruins in the area (e.g. Sikait), with minimal amounts concrete mortar and imported wood. The outposts are constructed on leveled ground but without any slab foundation. Each outpost includes a sleeping and work area, plus a separate kitchen building and a separate non-flushing pit latrine. These non-flushing latrines would serve the needs of rangers stationed at the outpost and any visitors to the outpost. Each latrine would be built from the same local stone at the other outpost buildings, and include a concrete slab foundation not to exceed 2.5 m², a PVC vent pipe, and a cement-lined fully sealed septic tank (i.e. closed system with no drainage field) with a depth not to exceed 2 m.

The outposts are built on rises above wadis or other major transportation corridors to provide rangers with a view of the surrounding area and access to transport the park's internal transport network. Each output also includes a covered car park to provide shaded space for two ranger vehicles. The car parks are made from imported or non-native wood and other vegetation. The outposts are equipped with solar photovoltaic (PV) arrays to provide minimal electric power and with a small water tank that is refilled by the rangers when they visit the outpost. Each outpost has a total footprint of approximately 30 m². The general locations for these planned interventions are remote desert locations within WGNP. More specific locations will be determined based on further planning.

Table 5.11: Ranger Outposts

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Vegetation could be located on one or more sites for targeted interventions and therefore vegetation could be disrupted during construction.
Stress on native wildlife	✓		Significant. Given the necessarily remote locations of the ranger outposts, impacts on wildlife habitat are possible.
Damage to coral reefs (from sedimentation)	✓		Not Significant. The planned ranger outposts will be located in the desert.
Physical and Chemical			
Surface Water: Biological contamination/eutrophication		✓	Not Significant. The planned ranger outposts will be located in the desert, away from any surface water bodies.
Surface Water: Increased turbidity (from soil sedimentation)	✓		Not Significant. The planned ranger outposts will be located in the desert, away from any surface water bodies.
Soil: Increased sedimentation	✓		Not Significant. The planned ranger outposts will be located in the desert, away from any surface water bodies.
Soil: Contamination		✓	Not Significant. The pit toilets planned for each ranger outpost will have limited use. In addition, the infrequency of precipitation in the area makes transport of waste from the latrine to surrounding soil minimal.
Air: Increased airborne particulates	✓		Not Significant. Although construction of the ranger outposts will create dust that reduces air quality in the immediate area, the remoteness of the planned general locations indicates that there will be no impact of human settlements or other resources.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Noise: Increased noise levels	✓		Not Significant. Although construction activities would create some noise, the remote locations of the planned outposts makes impacts on communities extremely unlikely.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Not Significant. The planned ranger outposts would be sited in extremely remote locations, away from any permanent human settlements.
Destruction and/or interference with traditional cultural practices		✓	Not Significant. The planned ranger outposts would be sited in extremely remote locations, away from any permanent human settlements.
Interference with social and/or economic livelihoods		✓	Not Significant. The planned ranger outposts would be sited in extremely remote locations, away from any permanent human settlements.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

Community Guard Post

The RSP employs local Bedouin as community guards throughout WGNP. Community guards supplement the monitoring capacity of the park rangers, alerting rangers to activities they observe within the park and participating in the RSP's ongoing park management activities. The LRS project plans to fund construction of a rustic shelter for community guards located at Ras Baghdadi to provide shade and protection from the elements. The community guard post will be constructed of non-native wood and thatch with an approximate area of 9m². It will not be equipped with any other services.

Table 5.12: Community Guard Post

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Vegetation could be located on the site of the planned community guard post and therefore vegetation could be disrupted during construction.
Stress on native wildlife	✓		Significant. Given that the community guard post likely would be sited in a coastal location that could be habitat to wildlife, particularly birds, impacts on wildlife habitat are possible.
Damage to coral reefs (from sedimentation)	✓		Not Significant. The planned community guard post will not require the disruption of soil during construction.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Not Significant. The planned community guard post will not require the disruption of soil during construction.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Soil: Increased sedimentation	✓		<i>Not Significant.</i> The planned community guard post will not require the disruption of soil during construction.
Air: Increased airborne particulates	✓		<i>Not Significant.</i> The planned community guard post will not require the disruption of soil during construction.
Noise: Increased noise levels	✓		<i>Not Significant.</i> Construction activities and related noise will be minimal.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	<i>Significant.</i> Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		<i>Significant.</i> Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	<i>Not Significant.</i> The planned community guard post would be a rustic structure that does not present any significant health or safety issues.
Destruction and/or interference with traditional cultural practices		✓	<i>Not Significant.</i> The planned community guard post will be built and operated by local people according to their traditional practices.
Interference with social and/or economic livelihoods		✓	<i>Not Significant.</i> The planned community guard post will be built and operated by local people according to their traditional practices.

WGNP Headquarters

The RSP is headquartered in Hurghada, some 300+ km north of WGNP's northern border. The RSP also has a permanent ranger presence in two ranger stations at the WGNP borders. One station at the northern coastal border about 50 m south of the Shams Alam resort and one at the southern coast border, just north of Hamatah. These ranger stations, which include work and accommodation space, serve the daily operational needs of the rangers working in the park. However, they do not serve the broader administrative function for park operations. This function largely goes unmet at this time.

Having a central location for park administration, coordination and planning would significantly improve overall park operation and management. Therefore the LRS project plans to provide funding to plan and design an administrative headquarters located in the village of Abu Ghusun, which is approximately in the middle of WGNP, north to south and along the coast. It is possible that the LRS project also will fund a minority percentage, likely no more than 20%, of the headquarters construction in addition to doing the planning and design. No planning or detail work has yet been done for the proposed WGNP headquarters building, but the building and related facilities and grounds would occupy a site of approximately 6,000 m². The building would accommodate a staff of approximately 40 people. The building itself would be constructed on a slab, using reinforced concrete and brick. The building likely would be two stories high. It would be equipped with all basic facilities including water supply, sewerage and electricity. Sewage would drain into a septic tank constructed on concrete and emptied by truck on a regular basis. The septic tanks and drainage fields would be constructed using best engineering practices, including:

- Septic Tank: Built from concrete and completely sealed, except for the outlet pipe to the drainage field
- Septic Tank: Capacity of no less than 500 liters per person
- Drainage Field: At least 100 feet from drinking water sources
- Drainage Field: Slope drainage field away from houses, buildings and any water supply
- Drainage Field: Keep drainage field unshaded and free from trees and shrubbery
- Drainage Field: Allow sufficient space to enlarge the drainage field if it should become necessary
- Drainage Field: Keep septic tanks or drainage field uncovered by driveways or concrete
- Septic Tanks and Drainage Fields: Locate septic tanks and drainfields away from drainage areas and waterways (the system should be a minimum of 500 m from the Red Sea)

Table 5.13: WGNP Headquarters

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Although the site that likely will be selected for construction is devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.
Stress on native wildlife	✓		Not Significant. Any location selected would be in the populated human settlement of Abu Ghusun.
Damage to coral reefs (from sedimentation)	✓		Significant. The site that likely would be selected is within the municipality of Abu Ghusun, an area where a large phosphates mining operation exists and the fringing reefs are heavily degraded. Regardless, sedimentation from construction could potentially run off into the Red Sea coastal waters in a significant flash flood event, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			
Surface Water: Biological contamination/eutrophication		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.
Soil: Contamination		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

5.22 Park Visitation Facilities

Solar Power Generation Systems

Because most of the SRS is not connected to the national electric power grid, some communities and remote areas do not have any access to electricity. The LRS project plans to procure and install several pilot solar PV systems, including solar panels, inverters, chargers and distribution wiring in targeted areas within WGNP. The systems will provide minimal electricity to power low voltage applications, such as lights. The general locations planned for these interventions include Qul'an Bay, Sikait, and possibly another location in WGNP. These systems will be similar to those currently installed at three operational ranger outposts in WGNP and proposed for the two additional ranger outposts that the LRS project plans to construct.

Table 5.14: Solar Power Generation Systems

Table 3.1.1. Solar Power Generation Systems			
Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		<i>Not Significant.</i> Solar system equipment would be place on the rooftops of existing buildings.
Stress on native wildlife	✓		<i>Not Significant.</i> Any location selected would be in populated human settlement areas.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Damage to coral reefs (from sedimentation)	✓		Not Significant. No disruption of soil and resulting sedimentation would occur to install or operate the solar systems.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Not Significant. No disruption of soil and resulting sedimentation would occur to install or operate the solar systems.
Soil: Increased sedimentation	✓		Not Significant. No disruption of soil and resulting sedimentation would occur to install or operate the solar systems.
Air: Increased airborne particulates	✓		Not Significant. No disruption of soil and resulting airborne dust would occur to install or operate the solar systems.
Noise: Increased noise levels	✓		Not Significant. Only minimal construction activity is required to install these systems, with minimal potential for additional noise.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of solar arrays can obstruct scenic views of the Red Sea and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Not Significant. Solar systems will be sited on the roofs of existing buildings, so there is a very limited potential for creating safety hazards for local residents.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.

Elevated Pedestrian Boardwalk

The LRS project concept for Qul'an Bay is to create as little impact on this unique and ecologically sensitive resource as possible while making it an attractive tourist day visit destination. Tourists already visit Qul'an on their own or with tour operators, but these visits are unmanaged and detrimental to the area's fragile natural assets. To accommodate walking along the Bay's long headland above the beach, the LRS project plans to construct an elevated boardwalk to keep visitors away from the edge of the headland. The soil the comprises the headland is unstable and subject to slumping at its edge. This presents a safety hazard as well as causing erosion of the headland onto the beach and mangroves below. The planned elevated boardwalk would be constructed from non-native wood, with pilings set in concrete to secure them to the ground. The boardwalk would be constructed in phases, with an eventual length of approximately 1,000 linear meters.

Table 5.15: Elevated Pedestrian Boardwalk

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. The headlands above the shoreline on which the planned boardwalk would be constructed is essentially devoid of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during construction.
Stress on native wildlife	✓		Significant. Because the boardwalk would be built on raised pilings, it would not create an absolute barrier to wildlife movement between the headlands and the shoreline. However, it would create an impediment to movement which could affect native wildlife.
Damage to coral reefs (from sedimentation)	✓		Significant. Although construction phase soil disruption would be limited to digging holes for the boardwalk pilings, given the steep and unstable slope of the ground between the headlands and the shoreline, sedimentation from construction could potentially run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.
Air: Increased airborne particulates	✓		Not Significant. Construction activities would be minimal, creating very little dust and consequent reduction in air quality in the immediate area.
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of the boardwalk could obstruct scenic views of the Red Sea and other local resources.
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to local residents.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

Nature Trails

To control visitor access to the sensitive ecological areas at targeted locations, the LRS project plans to develop nature trails. These trails would be constructed using rope and stakes to create boundaries within which visitors' movement would be restricted. The general locations planned for these interventions are Wadi el Gimal Island, Sharm Luliyah, Qul'an Bay and Ras Baghdadi.

Table 5.16: Nature Trails

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. The nature trails planned would be developed specifically to steer a path for visitors that avoids sensitive areas, including stands of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during construction.
Stress on native wildlife	✓		Significant. The nature trails planned would be developed specifically to steer a path for visitors that avoids sensitive areas, including critical wildlife habitat. However, it is possible that conflicts could occur affecting native wildlife as visitors move along nature trails.
Damage to coral reefs (from sedimentation)	✓		Not Significant. No disruption of soil would be required, meaning that no sedimentation from construction would occur.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Not Significant. No disruption of soil would be required, meaning that no sedimentation from construction would occur.
Soil: Increased sedimentation	✓		Not Significant. No disruption of soil would be required, meaning that no sedimentation from construction would occur.
Air: Increased airborne particulates	✓		Not Significant. No disruption of soil would be required, meaning that no airborne dust from construction would occur.
Noise: Increased noise levels	✓		Not Significant. Construction activities will be extremely limited, creating no significant additional noise.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Not Significant. Nature trail infrastructure will be limited to stakes and rope low to the ground, creating no obstructions to views.
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Not Significant. Construction activities will be extremely limited, creating no significant safety hazards.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Not Significant. Construction activities will be extremely limited, creating no significant safety hazards.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Interference with social and/or economic livelihoods		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.

Vehicle Access Route Demarcation

WGNP has a network of existing vehicle access trails that begin at various points along the coastal highway and generally follow the wadis west into the park's hinterlands. However, some visitors also create their own trails or drive parallel to existing trails, creating additional routes, disrupting vegetation and wildlife and creating safety hazards for themselves and others. In order to control the routes that visitors take within the park, the LRS project plans to demarcate the major existing trails. These route will link major points of interest within the park and will be receive signage as well. The demarcation will entail placement of small stones from the immediate area along the perimeter of the trails. No grading or other improvement will be made. The LRS project plans to demarcate approximately 70 km of trails throughout WGNP, primarily in the parks desert area. Short stretches of trails also are planned to be demarcated at Qul'an Bay, Sharm Luliyyah and at the camel market in El Shelateen.

Table 5.17: Vehicle Access Route Demarcation

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. The vehicles trails planned for demarcation would be developed specifically to steer a path for visitors that avoids the most sensitive areas of WGNP, including stands of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during demarcation.
Stress on native wildlife	✓		Significant. Motor vehicle travel through wildlife habitat is by definition disruptive to wildlife. However, the planned interventions will funnel vehicle traffic into designated corridors to keep more of WGNP vehicle free than is currently the case. However, it is possible that conflicts could occur as visitors move along vehicle access routes which could affect native wildlife.
Damage to coral reefs (from sedimentation)	✓		Not Significant. No disruption of soil would be required, meaning that no sedimentation from demarcation would occur.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Not Significant. No disruption of soil would be required, meaning that no sedimentation from demarcation would occur.
Soil: Increased sedimentation	✓		Not Significant. No disruption of soil would be required, meaning that no sedimentation from demarcation would occur.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Air: Increased airborne particulates	✓	✓	Not Significant. No disruption of soil would be required during demarcation, and traffic over routes during operation will remain limited for the foreseeable future, creating limited dust from vehicles using the routes. The potential for additional airborne dust is therefore limited.
Noise: Increased noise levels	✓		Not Significant. Demarcation activities will be extremely limited, and traffic over routes during operation will remain limited for the foreseeable future, with neither creating any significant additional noise.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Not Significant. Vehicle demarcation route infrastructure will be limited to small stones placed at the edges of the route, creating no obstructions to views.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Not Significant. Demarcation activities will be extremely limited, creating no significant safety hazards.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Not Significant – Construction Phase. Demarcation activities will be extremely limited, creating no significant safety hazards. Significant – Operational Phase. During operation, signage limiting vehicle speed and warning of approaching hazards or possible encounters with human populations will be important to prevent accidents.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.

Hiking Trail Demarcation

As with the vehicle trails, WGNP has an existing network of hiking trails. These are used both by park visitors and by local Bedouin who traverse the park. The LRS project plans to demarcate this existing trail network to control visitor access to the park's fragile natural assets. Trail demarcation will include placement of stones from the immediate area at the perimeter of the trails and the addition of signage. No construction will be undertaken as part of this demarcation. The project plans to demarcate approximately 50 km of hiking trails throughout the interior (i.e. desert) areas of WGNP.

Table 5.18: Hiking Trail Demarcation

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. The hiking trails to be demarcated already exist and would be selected specifically to steer a path for visitors that avoids sensitive areas, including stands of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during demarcation.
Stress on native wildlife	✓		Significant. The hiking trails planned would be developed specifically to steer a path for visitors that avoids sensitive areas, including critical wildlife habitat. However, it is possible that conflicts could occur as visitors move along hiking trails which could affect native wildlife.
Damage to coral reefs (from sedimentation)	✓		Not Significant. Planned hiking trail demarcation would be in WGNP’s interior, far from the coast.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Not Significant. Planned hiking trail demarcation would be in WGNP’s interior, far from the coast.
Soil: Increased sedimentation	✓		Not Significant. Planned hiking trail demarcation would be in WGNP’s interior, far from the coast.
Air: Increased airborne particulates	✓		Not Significant. No disruption of soil would be required, meaning that no airborne dust from demarcation would occur.
Noise: Increased noise levels	✓		Not Significant. Demarcation activities will be extremely limited, creating no significant additional noise.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Not Significant. Hiking trail infrastructure will be limited to placement of small stones along existing trails and minimal signage, creating no obstructions to views.
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Not Significant. Demarcation activities will be extremely limited, creating no significant safety hazards.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Not Significant. Demarcation activities will be extremely limited, creating no significant safety hazards.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.

Car Parks

Currently visitors to WGNP's various points of interest park informally wherever they choose. Often this means they park on the side of the coastal highway, creating a safety hazard for themselves and others, in ecologically fragile areas, damaging local vegetation, on unstable ground, getting their vehicles stranded or in other inappropriate areas. The LRS project plans to develop several car parks in strategic locations throughout WGNP to reduce these problems. These car parks will not entail any construction of paving work. The work will be limited to grading of the parking areas and demarcation of the parking area boundaries. Each parking area will be a maximum of 2000m². The general locations planned for these interventions include Qul'an Bay, Sharm Luliyah and Ras Baghdadi.

Table 5.19: Car Parks

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Planned car parks would be sited in areas virtually devoid of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during construction.
Stress on native wildlife	✓	✓	Significant. Planned car parks would be sited in areas with significant human activity already. However, it is possible that conflicts could occur during construction and operation that could affect native wildlife.
Damage to coral reefs (from sedimentation)	✓		Significant. Although construction will be limited to grading of sites to level the parking area, it is possible that some erosion and sedimentation could occur.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Although construction will be limited to grading of sites to level the parking area, it is possible that some erosion and sedimentation could occur.
Soil: Increased sedimentation	✓		Significant. Although construction will be limited to grading of sites to level the parking area, it is possible that some erosion and sedimentation could occur.
Air: Increased airborne particulates	✓		Significant. Although construction will be limited to grading of sites to level the parking area, it is possible that some airborne dust could be stirred up from grading of the sites.
Noise: Increased noise levels	✓		Significant. Although construction will be limited to grading of sites to level the parking area, some additional noise is likely.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of the car parks could obstruct scenic views of the Red Sea and other local resources.
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant – Construction Phase. Lack of safety procedures and/or equipment can result in accidents and injuries to local residents. Significant – Operational Phase. During operation, signage limiting vehicle speed and dictating parking rules will be important to prevent accidents.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

Camel Yard

Camel riding is a popular tourist activity throughout much of Egypt. The LRS project plans to fund construction of a small camel yard at Ras Hunkurab where local people can pen their camels for hiring by tourists. The pen would be constructed from imported wood to accommodate a maximum of 12 animals. The pen would have a footprint not to exceed 80 m². All fodder for the camels would be imports (i.e. non-native vegetation).

Table 5.20: Camel Yard

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓	✓	Significant. The planned camel yard would be sited in an area virtually devoid of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during construction.
Stress on native wildlife	✓	✓	Significant. The planned camel yard would be sited in an area with significant human activity already. However, it is possible that conflicts could occur during construction and operation that could affect native wildlife.
Damage to coral reefs (from sedimentation)	✓	✓	Not Significant – Construction Phase. Construction will be limited to fencing of the area, creating no erosion. Significant – Operational Phase. Disruption of the soil from animals within the camel presents the potential for some erosion and sedimentation occurring.
Physical and Chemical			
Surface Water: Biological contamination/eutrophication		✓	Significant. Camel manure must be removed regularly to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Disruption of the soil from animals within the camel presents the potential for some erosion and sedimentation occurring.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Soil: Increased sedimentation	✓		Significant. Disruption of the soil from animals within the camel presents the potential for some erosion and sedimentation occurring.
Air: Increased airborne particulates	✓		Not Significant. Disruption of the soil from animals within the camel yard will not be sufficient to significantly impact ambient air quality.
Noise: Increased noise levels	✓	✓	Not Significant. Increased noise during construction and operation will not be sufficient to disrupt nearby activities.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of the camel yard could obstruct scenic views of the Red Sea and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓	✓	Not Significant – Construction Phase. Construction will be limited to fencing the camel yard perimeter, presenting no significant safety hazards. Significant – Operational Phase. Lack of safety procedures and/or equipment can result in accidents and injuries to workers and to customers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Not Significant. Construction and operation will be extremely limited, presenting no significant hazards to local residents.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.

Interpretive Signs

WGNP currently has extremely limited signage, both at entry points and within the parks boundaries. In order to attract visitors, and to help ensure their safety and manage their movement within the park, signage is necessary. The LRS project plans to develop a comprehensive signage program that include planning, design, implementation and maintenance of signage throughout the park. The signage itself will be produced locally using local materials to the extent practicable. Areas that will specifically targeted for signage because of their high value as visitor attractions include Wadi el Gimal Island, Sharm Luliyah, Qul'an Bay and Sikait.

Table 5.21: Interpretive Signs

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓	✓	Not Significant. The planned signage would not be damage or destroy existing vegetation. In fact, the signage will be used in part to manage the movement of WGNP visitors to avoid damage to sensitive vegetation.
Stress on native wildlife	✓	✓	Not Significant. The planned signage would not interfere with wildlife. In fact, the signage will be used in part to manage the movement of WGNP visitors to avoid damage to sensitive wildlife habitat.
Damage to coral reefs (from sedimentation)	✓		Not Significant. Signage installation will involve extremely limited disruption to soil, with no significant erosion potential.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Not Significant. Signage installation will involve extremely limited disruption to soil, with no significant erosion potential.
Soil: Increased sedimentation	✓		Not Significant. Signage installation will involve extremely limited disruption to soil, with no significant erosion potential.
Air: Increased airborne particulates	✓		Not Significant. Disruption of the soil from signage installation will not be sufficient to significantly impact ambient air quality.
Noise: Increased noise levels	✓		Not Significant. Increased noise during construction and operation will not be sufficient to disrupt nearby activities.
Views: Views obstructed/Aesthetic quality diminished		✓	Significant. Poor siting of signage could obstruct scenic views of the Red Sea and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers and to customers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Not Significant. Construction and operation will be extremely limited, presenting no significant hazards to local residents.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.

Campgrounds

Currently there are no designated campgrounds within the WGNP borders. To the extent that visitors are making overnight stays in the park, they are free to camp wherever they decide regardless of the appropriateness of the site selected. In order to better manage future oversight stays to the park and provide a crucial amenity that international visitors expect in a national park, the LRS project plans to fund establishment of two campgrounds within the park's boundaries – one at the ancient Roman emerald mining site of Sikait and one at the coastal site of Sharm Luliyah (west of the coastal highway). The funding for these interventions would include site planning and design of the campgrounds, leveling of the area for the campgrounds if necessary), demarcation of the campgrounds and specific campsites, and minimal signage. No utilities or other amenities are planned.

Table 5.22: Campgrounds

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Planned campgrounds would be sited in remote parts of WGNP, possibly near vegetation that would provide shade. It is possible that vegetation could be damaged during construction and operation.
Stress on native wildlife	✓	✓	Significant. Planned campgrounds would be sited in remote parts of WGNP, in areas inhabited by native wildlife. It is therefore possible that conflicts could occur during construction and operation that could affect native wildlife.
Damage to coral reefs (from sedimentation)	✓		Significant. Although construction will be limited to grading of sites to level the campground area, it is possible that some erosion and sedimentation could occur.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Although construction will be limited to grading of sites to level the campground area, it is possible that some erosion and sedimentation could occur.
Soil: Increased sedimentation	✓		Significant. Although construction will be limited to grading of sites to level the campground area, it is possible that some erosion and sedimentation could occur.
Air: Increased airborne particulates	✓		Significant. Although construction will be limited to grading of sites to level the campground area, it is possible that some airborne dust could be stirred up from grading of the sites.
Noise: Increased noise levels	✓		Significant. Although construction will be limited to grading of sites to level the campground area, some additional noise is likely.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of the campgrounds could obstruct scenic views of the Red Sea and other local resources.
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Unhealthy and/or unsafe conditions for local residents	✓	✓	Not Significant. Construction phase activities will be limited and would not present any significant hazards. No facilities or equipment will be present at the completed campgrounds that present a hazard to local residents.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

Installation of Mooring Buoys at SRS Dive Sites

Egypt has made tremendous strides in the management of off-shore diving sites through the establishment and maintenance of a comprehensive mooring buoy program through most of its near shore Red Sea territory. In fact, Egypt now has more than 1,000 mooring buoys in place. However, mooring buoy coverage in the SRS remains relatively limited, particularly at key locations that are likely to receive substantially increased levels of tourist activities in the coming years. Therefore the LRS project intend to fund the establishment of mooring buoys off shore at Sharm Luliyah, Qul'an Bay and Wadi el Gimal Island.

Table 5.23: Installation of Mooring Buoys at SRS Dive Sites

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Stress on native wildlife (fish and other marine species)	✓	✓	Significant. Planned mooring buoys have to be properly sited, installed and managed to be effective. A breakdown in any of these area could negatively affect fish and other marine species.
Damage to coral reefs	✓	✓	Significant. Planned mooring buoys have to be properly sited, installed and managed to be effective. A breakdown in any of these area could negatively affect coral reefs.
Physical and Chemical			
Noise: Increased noise levels		✓	Significant. Management of mooring sites is critical to maintaining a tranquil environment at dive sites. Too many boats moored to a buoy, or too many buoys in a given area will create a noise level and general chaos that will significantly diminish the visitor experience.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to mooring buoy installation teams, boat crews and boat passengers.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Unhealthy and/or unsafe conditions for local residents	✓	✓	Not Significant – Construction Phase. Mooring buoy installation will be done by professionals without any involvement of local residents in the installation procedure. Not Significant – Operational Phase. Mooring buoys do not present a hazard to local residents.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.

Planting Native Vegetation

In order to create a more aesthetically appealing environment for visitors and to help stabilize the soil in the area, the LRS project intends to fund procurement and planting of native trees and scrubs at Sharm Luliyah. The number and types of trees and scrubs is to be determined after more detailed planning.

Table 5.24: Planting Native Vegetation

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓	✓	Significant – Construction. New native vegetation must be planted so that it does not interfere with the growth of existing native vegetation. Not Significant – Operation. Once the new trees and scrubs are planted, their would be no ongoing issues related to the existing vegetation.
Stress on native wildlife		✓	Significant. It is important that only native vegetation is planted so as not to disrupt the feeding patterns of native wildlife.
Damage to coral reefs (from sedimentation)	✓		Significant. Although tree and scrub plants will create only very limited disruption to the soil, it is possible that some erosion and sedimentation could occur.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Although tree and scrub planting will create only very limited disruption to the soil, it is possible that some erosion and sedimentation could occur.
Soil: Increased sedimentation	✓		Significant. Although tree and scrub planting will create only very limited disruption to the soil, it is possible that some erosion and sedimentation could occur.
Air: Increased airborne particulates	✓		Not Significant. Soil disruption will not be sufficient to create airborne dust.
Noise: Increased noise levels	✓		Not Significant. Tree and scrub planting will not create significant noise.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of trees and scrubs could obstruct scenic views of the Red Sea and other local resources.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		<i>Not Significant.</i> Tree and scrub planting does not present any significant hazards.
Unhealthy and/or unsafe conditions for local residents	✓	✓	<i>Not Significant.</i> Tree and scrub planting does not present any significant hazards.
Destruction and/or interference with traditional cultural practices		✓	<i>Not Significant.</i> Planting of native trees and scrubs will not affect local communities.
Interference with social and/or economic livelihoods		✓	<i>Not Significant.</i> Planting of native trees and scrubs will not affect local communities.

Rehabilitation of Natural Vegetation

Ras Baghdadi is a unique ecological area located at the outlet of Wadi el Gimal along the coast within WGNP. The area has a substantial mangrove stand that is unique for that stretch of the SRS coast. This mangrove stand has been degraded in recent years by camel grazing and other overuse of the resource. In concert with a RSP ranger led mangrove management plan, the LRS project will fund rehabilitation of the mangroves at Ras Baghdadi, including transplant of mangrove trees from established nurseries.

Table 5.25: Rehabilitation of Natural Vegetation

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓	✓	Not Significant. Planned planting of new mangrove saplings will not affect existing vegetation.
Stress on native wildlife	✓		Significant. It is important that new saplings are planted so as not to disrupt existing wildlife habitat along the shoreline.
Damage to coral reefs (from sedimentation)	✓		Not Significant. Planned planting of new mangrove saplings will not affect existing vegetation.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Not Significant. Planned planting of new mangrove saplings will not cause significant sedimentation.
Soil: Increased sedimentation	✓		Not Significant. Planned planting of new mangrove saplings will not cause significant sedimentation.
Air: Increased airborne particulates	✓		Not Significant. Planned planting of new mangrove saplings will not cause any terrestrial soil disruption.
Noise: Increased noise levels	✓		Not Significant. Planned planting of new mangrove saplings will not create significant noise.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Not Significant. Planned planting of new mangrove saplings will not obstruct scenic views of the Red Sea and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Not Significant. Planned planting of new mangrove saplings does not present any significant hazards.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Not Significant. Planned planting of new mangrove saplings does not present any significant hazards.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Destruction and/or interference with traditional cultural practices		✓	Not Significant. Planned planting of new mangrove saplings will not affect local communities.
Interference with social and/or economic livelihoods		✓	Not Significant. Planned planting of new mangrove saplings will not affect local communities.

Bird Watching and Observation Platforms

Bird watching has become a worldwide phenomenon in terms of its popularity. The SRS has a number of rare and exotic bird species that already attract both Egyptian and international tourists to the area. However, these visits are in large part unmanaged currently, creating the potential for serious damage to the fragile natural habitats of these unique resources. Three coastal areas, in particular, are thriving and critical habitat for local birds – Wadi el Gimal Island, Qul'an Bay and Ras Baghdadi. In order to help the RSP better manage bird watching and other visits to these sensitive areas, the LRS project plans to fund construction of platforms to provide visitors with good vantage points from which to observe and photograph birds and fauna, while minimizing intrusion and degradation of these fragile ecosystems. The planned platforms would be built from non-native wood, with the height of the platform depending on its location, but not to exceed 3m. Each platform would be built to accommodate approximated eight people at a time. The LRS project plans to construct approximately six platforms total at these three locations.

Table 5.26: Bird Watching and Observation Platforms

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Platforms will be sited to avoid sensitive areas. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during construction.
Stress on native wildlife	✓	✓	Significant. Platforms will be sited to avoid sensitive areas. However, it is possible that wildlife habitat could be disrupted during construction or operation
Damage to coral reefs (from sedimentation)	✓		Significant. Although construction phase soil disruption would be limited to digging holes for the platform pilings, sedimentation from construction could potentially run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Air: Increased airborne particulates	✓		Not Significant. Construction activities would be minimal, creating very little dust and consequent reduction in air quality in the immediate area.
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of the platforms could obstruct scenic views of the Red Sea and other local resources.
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to local residents.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.

Beach Park Facilities

Currently there are no visitor facilities in WGNP. Because much of the terrestrial (desert) areas of the park are extremely remote, the need to construct facilities to support visits is not yet critical. However, the coastal locations within the park are easily accessible from the coastal highway, which generally is no more than 500m shoreline. Therefore, constructing facilities to manage the impact of current visitation levels and catalyze increased visitation, the LRS project plans to fund procurement and construction of basic infrastructure including snack bars, beach parasols, park benches and shaded areas. All of these planned interventions will be implemented as part of an overall park infrastructure planning exercise to determine the best placement of facilities and the best systems for operation and management of the facilities themselves. Snack bars would be built of concrete and brick, with concrete slab foundations not to exceed 4m². A maximum of four snack bars is planned (one per location). Park benches would be constructed from poured concrete. Each bench would be placed on a concrete slab foundation not to exceed 1.5m² per bench. A maximum of 20 benches is planned. Parasols and shaded areas would be constructed from non-native wood and other vegetation (e.g. thatch). The numbers for each are to be determined based on specific site requirements. The general locations planned for these interventions include Wadi el Gimal Island, Qul'an Bay, Sharm Luliyah and Ras Baghdadi.

Table 5.27: Beach Park Facilities

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓	✓	Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.
Stress on native wildlife	✓	✓	Significant. The locations planned are ecologically sensitive, with unique wildlife resources that could be affected by construction and operation.
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of buildings and other infrastructure can obstruct scenic views of the Red Sea and other local resources.
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to local residents.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

Pit Latrines at Beaches

As with other park visitor facilities, there are no public toilets currently located within WGNP. In order to manage the current and increasing park visitation and provide the basic services needed to attract park visitors, the LRS project plans to fund construction of non-flushing latrines at key coastal location that currently attract visitors and that likely will attract increasing numbers of visitors as the park becomes a more popular destination. Approximately six non-flushing pit

latrines would be constructed at each location (three for male visitors and three for female visitors), with the six non-flushing pit latrines housed in a single building separated for male and female visitors. Each building would be constructed on a concrete slab foundation not to exceed 10 m². The building itself would be constructed of concrete and brick. Each building would be equipped with a potable water supply (trucked water to be stored in a water tank on the roof of each building) to supply faucets within the building. Waste from each toilet would be collected in an underground sealed septic tank next to the building. The septic tank would be constructed on concrete with an approximate capacity of 3,000 liters. The septic tanks would be emptied by truck on a regular basis. These locations include Wadi el Gimal Island, Sharm Luliyyah and Qul'an Bay.

Table 5.28: Pit Latrines at Beaches

Category/Impact	Project Phase		Significance
	Construction	Operation	
Biological			
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.
Stress on native wildlife	✓		Significant. The locations planned are ecologically sensitive, with unique wildlife resources that could be affected by construction and operation.
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.
Physical and Chemical			
Surface Water: Biological contamination/eutrophication		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.
Soil: Contamination		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.

Category/Impact	Project Phase		Significance
	Construction	Operation	
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.
Social and Cultural			
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.

Section Six: Recommended Mitigation Measures

In this section the PEA team uses the analysis completed in *Section Five, Potential Environmental Impacts*, to identify mitigation measures that will eliminate or reduce to acceptable levels any potential negative environmental impacts from planned physical interventions. A table is presented for each planned physical intervention, with mitigation measures proposed for each significant environmental impact. These tables are based on the intervention-specific tables presented in Section Five. The mitigation measures are best practices in the following areas:

Planning

- Planning: Sites should be selected that are devoid of vegetation
- Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5%
- Planning: To the extent possible, facilities should be sited outside any known wildlife corridors or habitat
- Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources
- Planning: Facilities with offending odors (e.g. septic tanks, SWM facilities) should be sited downwind of settlements and other areas with significant activity
- Planning: Sites for structures should be selected that do not obstruct important views
- Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting.
- Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions
- Planning: The LRS project must assure that any sites planned for construction do not interfere with known antiquities sites
- Planning: Mooring buoys must be sited to minimize damage to coral and other marine species habitat in terms of their individual placement and the density of mooring buoys in a given area
- Planning: Site selection is critical. Sites must be selected that do not displace or disrupt any existing habitat for marine species living in the shallows

Engineering and Construction

- Engineering and Construction: No vegetation surrounding the site should be damaged during construction
- Engineering and Construction: The perimeter of each facility must be completely enclosed by fencing that will prevent wildlife penetration
- Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site
- Engineering and Construction: Septic tanks must be constructed using impermeable materials

- Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area
- Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities
- Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be any archeological artifact, and to stop work until discovery is investigated
- Engineering and Construction: Mooring buoys must be installed by qualified installation teams (e.g. HEPCA) using accepted best practices
- Engineering and Construction: Planting operations must be done by trained individuals knowledgeable about the local ecology

Environmental Management

- Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site
- Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
- Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow

Health and Safety

- Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspections to assure safety procedures are followed
- Health and Safety: Contractors/builders must certify that all equipment used is in good working order
- Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries

Facilities Management

- Facilities Management: The area outside the perimeter of the facility must be regularly patrolled to remove any organic or inorganic waste that might be harmful to native wildlife
- Facilities Management: All facilities must have written health and safety procedures governing their activities, and necessary safety equipment on site
- Facilities Operation: Facilities operators must report to LRS project any discovery that might be any archeological artifact
- Facilities Operation: Rangers or their designees must regularly police sites to inspect for damage and remove any litter

- Facilities Management: Rules regarding the number of boats that can be moored to a given buoy at any one time must be obeyed by boat operators and informed by RSP rangers; Buoys must be repaired or replaced as soon as they are reported damaged
- Facilities Management: All mooring buoy installation and maintenance teams must be certified and be using equipment that is in good condition; all boats must be licensed and all crews certified

Community Participation

- Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
- Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Education and Information Dissemination

- Education and Information Dissemination: Signage must be posted in the vicinity of facilities asking visitors to avoid contact with and damage to vegetation.
- Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites
- Education and Information Dissemination: Signage on public toilets should explain that dumping of any chemicals into the toilets is strictly forbidden
- Education and Information Dissemination: Signage must be posted in areas where vehicle access routes cross areas known to be traversed by Bedouin families, warning visitors to drive slowly and be alert.
- Education and Information Dissemination: Written information and face to face meetings should be provided by the LRS project and/or the RSP rangers warning Bedouin to be careful for themselves and their livestock near vehicle access routes
- Education and Information Dissemination: Boat operators must receive briefings from the LRS project and/or the RSP rangers regarding proper mooring buoy use
- Education and Information Dissemination: Boat crews must provide safety briefings to passengers at the start of each excursion

Many of the mitigation measures/best practices apply to multiple interventions and are presented as such. That means that the same mitigation measures are sometimes repeated for the different impacts resulting from a given physical intervention. For example, placement of erosion control barriers around a construction site to prevent erosion of soil may be presented as a mitigation measure for (a) sedimentation, (b) surface water turbidity and (c) coral reef damage resulting from increased surface water turbidity. In this case, three different and related impacts are addressed in part by the same mitigation measures.

The PEA team identifies avoiding relocation of homes, shops or other facilities of local importance as a mitigation measure to prevent social, cultural or economic disruptions to targeted communities. As mentioned in Section Five, relocation of critical community infrastructure often has unanticipated negative impacts, even when residents voluntarily agree to it, and the conditions into which they are being moved are objectively an improvement to their living conditions.

6.1 Community Development Infrastructure

As discussed in Section Four, physical interventions supporting community development are divided into two subcategories:

- Basic infrastructure to support day to day life
- Enterprise infrastructure to support income generation and tourism development

6.11 Basic infrastructure to support daily life

The LRS project plans to fund construction of a limited quantity of basic infrastructure in targeted communities in the SRS. In all cases, the project will support the planning of infrastructure types and the piloting of specific infrastructure units as models to be replicated with funding and support from non-project sources.

Community Self-Help Centers

These centers would serve as gathering space for community activities. The specific uses of the centers would be decided by the community, and likely would include basic education, health clinic space, meeting space, space for other small community services. The buildings would be constructed of brick and concrete, on a concrete slab foundation with a footprint not to exceed 50 m². No water supply sewerage or electricity are planned. The planned general locations for these interventions include Qul'an Bay and Hamatah.

Table 6.1: Community Self-Help Centers

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Physical and Chemical				
Surface Water: Increased turbidity (from soil erosion)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Increased sedimentation (from soil erosion)	✓		Significant. Construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area
Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting.
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspectors to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to local residents.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites • Facilities Management: All facilities must have written health and safety procedures governing their activities, and necessary safety equipment on site, and necessary safety equipment on site

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none"> • Planning: LRS project must assure that any sites planned for construction do not interfere with known antiquities sites • Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated • Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

Sanitary Latrines with Septic Tanks at Beaches

These non-flushing latrines would serve the needs of local residents in targeted communities who currently have no sanitary facilities available. Each latrine would include a brick and mortar housing, a concrete slab foundation not to exceed 2.5 m², a PVC vent pipe, and a cement-lined fully sealed septic tank (i.e. closed system with no drainage field) with a depth not to exceed 3 m. Approximately eight latrines are planned. The septic tanks would be emptied on a regular basis by trucks. The planned general locations for these interventions include Sharm Luliyah and Qul'an Bay.



Figure 6.1: Example of Erosion Control Barrier

Table 6.2: Sanitary Latrines with Septic Tanks at Beaches

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none">• Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5%• Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site• Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Physical and Chemical				
Surface Water: Biological contamination/eutrophication		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.	<ul style="list-style-type: none">• Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources• Engineering and Construction: Septic tanks must be constructed built using impermeable materials• Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Soil: Contamination		✓	Significant. Septic tanks must be sealed to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil	<ul style="list-style-type: none"> • Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow • Education and Information Dissemination: Signage on the pit latrines should explain proper use and strictly forbid dumping of any chemicals into the latrines.
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.	<ul style="list-style-type: none"> Planning: Septic tanks should be sited downwind of settlements and other areas with significant activity Engineering and Construction: Septic tanks must be constructed built using impermeable materials Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.	<ul style="list-style-type: none"> Planning: Sites should be selected that do not obstruct important views Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspections to assure safety procedures are followed Health and Safety: Contractors/builders must certify that all equipment used is in good working order

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites • Education and Information Dissemination: LRS project must provide education in basic sanitation practices for latrines • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none"> • Planning: LRS project must assure that any sites planned for construction do no interfere with known antiquities sites • Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated • Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

Fresh Water Tanks and Standpipes

Because there are no local groundwater or surface water resources in SRS coastal areas, residents rely on trucked water for their basic needs. This water is however expensive and of inconsistent quality. Water tanks would be placed on the roofs of existing buildings in the community or on the roofs of building to be constructed by LRS (e.g. community self-help centers). The tanks would be prefabricated polyurethane with an estimated volume of 2000 liters. The tanks would include basic PVC piping to communal standpipes. The planned general locations for these interventions include Sharm Luliyah and Qul'an Bay.

Table 6.3: Fresh Water Tanks and Standpipes

Table 6.1: Fresh Water Tanks and Standpipes				
Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Physical and Chemical				
Views: Views obstructed/Aesthetic quality diminished		✓	Significant. Poor siting of tanks can obstruct scenic views of the Red Sea and other local resources.	<ul style="list-style-type: none">• Planning: Sites should be selected that do not obstruct important views• Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting.

Replacement or Provision of Power Generators

The electric power grid does not serve many small coastal communities in the SRS. The LRS project will procure and install a small diesel powered generator to serve the basic electricity needs of residents currently living in the area around Qul'an Bay. The generator will have an estimated generation capacity of 20kW. The generator and fuel tank will be located on a concrete slab not to exceed 4 m². The project might also purchase and install a larger diesel power generator for use in the village of Hamatah. This generator would have an estimated generation capacity of 800 kW. This generator would be housed in a self-contained structure built on a concrete slab and made of bricks and concrete. The generator would be set apart from housing and other community structures. The planned general locations for these two separate interventions are Qul'an Bay and Hamatah, respectively.

Table 6.4: Replacement or Provision of Power Generators

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife		✓	Significant. Although the locations planned are already populated human settlements, increased noise levels from generators could disrupt wildlife in the area.	<ul style="list-style-type: none">• Planning: To the extent possible, generators should be sited in areas that do not conflict with known wildlife corridors or habitat
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none">• Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5%• Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site• Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Physical and Chemical				
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none">• Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5%• Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site• Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none">• Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5%• Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site• Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Air: Increased airborne particulates	✓	✓	Significant. (1) Construction activities create dust that reduces air quality in the immediate area; (2) Diesel generator exhaust creates airborne particulates in the immediate area	<ul style="list-style-type: none">• Planning: Diesel generators should be sited downwind and as far from settlement areas as possible (minimum of 50 m from settlements)• Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Noise: Increased noise levels	✓	✓	Significant. Construction activities and operation of diesel generators create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> Planning: Diesel generators should be sited as far from settlement areas as possible (minimum of 50 m from settlements) Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) can send diesel fumes into populated areas.	<ul style="list-style-type: none"> Planning: Diesel generators should be sited downwind and as far from settlement areas as possible (minimum of 50 m from settlements)
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of generators can obstruct scenic views of the Red Sea and other local resources.	<ul style="list-style-type: none"> Planning: Sites should be selected that do not obstruct important views Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspectors to assure safety procedures are followed Health and Safety: Contractors/builders must certify that all equipment used is in good working order

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to local residents. Special precautions are needed in the vicinity of fuel tanks.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Health and Safety: A fence should be constructed around the perimeter of the installed generator and fuel tank to prevent injuries to resident • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites and going near operational generators • Training: LRS project must provide training to residents authorized to operate and maintain generators
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Upgrading and/or Restoration of Fishermen Houses or Other Small Informal Housing Units

The 17 families now resident at Qul'an Bay live in improvised shacks made from scrap wood and other materials with no sanitary services. The primary purpose for improving their dwellings is to improve their living conditions. The second purpose is to improve the overall aesthetic quality of the area as a tourist destination. Increased tourism will benefit the local residents directly by bringing customers to existing local enterprises and providing the locals with incentive to invest in additional enterprises. The housing work planned would be limited to existing structures. No new structures would be built. Wood and other locally available materials would be used. The planned general location for this intervention is Qul'an Bay.

Table 6.5: Upgrading and/or Restoration of Fishermen Houses or Other Small Informal Housing Units

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none">• Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site• Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Physical and Chemical				
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none">• Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site• Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none"> • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspections to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe conditions for local residents	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to local residents	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Health and Safety: A fence should be constructed around the perimeter of the installed generator and fuel tank to prevent injuries to resident • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites and going near operational generators
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Construction of Model Houses for Bedouin Fishermen and Other Local Inhabitants

The LRS project plans to construct no more than 10 housing units with a maximum footprint of 120 m² per unit. These units would be part of a larger development plan the LRS project has proposed. The buildings would be constructed on a concrete slab, with the building itself made from bricks and concrete. Each house would include water supply (roof tanks) and a flushing toilet connected to a septic tank (for each house), both with necessary piping. The planned general location for this intervention is Hamatah.

Table 6.6: Construction of Model Houses for Bedouin Fishermen and Other Local Inhabitants

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Damage to coral reefs (from sedimentation)	✓		Significant. Although all planned construction will be on the west side of the coastal highway, sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none">• Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5%• Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site• Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Physical and Chemical				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Surface Water: Biological contamination/eutrophication		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.	<ul style="list-style-type: none"> • Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow • Education and Information Dissemination: LRS project must explain to households that dumping of any chemicals into the toilets is strictly forbidden
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Although all planned construction will be on the west side of the coastal highway, sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Soil: Increased sedimentation	✓		Significant. Although all planned construction will be on the west side of the coastal highway, construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Soil: Contamination		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.	<ul style="list-style-type: none"> • Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow • Education and Information Dissemination: LRS project must explain to households that dumping of any chemicals into the toilets is strictly forbidden
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.	<ul style="list-style-type: none"> • Planning: Septic tanks should be sited downwind of settlements and other areas with significant activity • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspections to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites • Education and Information Dissemination: LRS project must provide education in basic sanitation practices for latrines • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions.
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none"> Planning: LRS project must assure that any sites planned for construction do no interfere with known antiquities sites Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

Material Recovery Facilities and Small Solid Waste Disposal Facilities

The LRS project plans to support the establishment and/or operation of several solid waste management (SWM) facilities. These facilities would in some cases be used for collection, sorting and recycling of materials. In this case, they are termed Material Recovery Facilities (MRFs). Such facilities are only practical when the waste stream entering the facility is primarily or entirely non-organics, completely non-hazardous and comprised of materials for which there is an established wholesale market. The waste stream from resort facilities (minus the food waste), meets these criteria. Specific descriptions of LRS support to each planned facility follows:

- **Shagra IDC** – The LRS project plans to support the establishment of an MRF in the proximity of the Shagra Integrated Development Center or IDC,. The site is located about 2 km southwest of Marsa Alam and about 16 km south of the Shagra IDC. The 4,000 m² site is located in the existing Marsa Alam industrial zone will receive waste primarily from the Shagra IDC. The activity is being led by a prominent Non-Governmental Organization (NGO) in the SRS called the Hurghada Environmental Protection and Conservation Association (HEPCA). The LRS funding will be limited to procurement of equipment for the MRF and technical assistance and training for the MRF management and staff. No LRS funds will be used for construction of facilities associated with the MRF.
- **Shams Alam** – This small MRF, located on the west side of the coastal highway and adjacent to the Shams Alam resort, was established with funds from a previous USAID-funded program called the Egyptian Environmental Policy Program (EEPP). The LRS project will not fund construction of any facilities at the site. LRS assistance is limited to ongoing technical assistance and training for the facility, and procurement of manual compactor for compacting aluminum, plastic and paper prior to transport.
- **Hamatah** – The LRS project plans to provide funding to plan and construct a small waste sorting facility (not a full MRF) on approximately 100 m² of land to the west of the coastal highway in Hamatah. The facility will include a steel fenced perimeter enclosing the entire site. The site will be graded to make it level. Inside the perimeter no permanent structures will be built. There will be several covered areas made from wood and canvas to provide shade for the employees. There will be equipment on site to sort and process recyclable materials. No solid waste will be kept permanently at the site.
- **El Shelateen** – There currently is not formal SWM facility in El Shelateen. Solid waste is dumped in a number of sites throughout the municipality, with the largest such site being an informal landfill covering approximately 1,000 m² on the outskirts of the town, near the commercial market. Because there is a large camel market in El Shelateen, animal carcasses also are dumped in the informal landfill. This creates an extremely unsanitary situation, with flies and other disease carries insects attracted to the site. As part of a larger redevelopment plan for El Shelateen, the LRS project plans to construct a number of small SWM facilities, with waste segregated by type. All of these facilities (maximum of three total) will be fenced and include the equipment necessary to process recyclable materials. A separate landfill will be constructed to handle the animal waste from the camel market.

Table 6.7: Material Recovery Facilities and Small Solid Waste Disposal Facilities

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓	✓	Significant. The locations planned are already populated human settlements. However: (1) The size of the planned Shagra MRF calls for careful planning to avoid any micro-habitats for local wildlife; (2) It is important that wildlife not gain access to any organic matter disposed temporarily or permanently at any planned sites. Ingesting human food waste might damage their systems and/or disrupt their normal feeding patterns.	<ul style="list-style-type: none">• Planning: To the extent possible, facilities should be sited outside any known wildlife corridors or habitat• Engineering and Construction: The perimeter of each facility must be completed enclosed by fencing that will prevent wildlife penetration• Facilities Management: The area outside the perimeter of the facility must be regularly patrolled to remove any organic or inorganic waste that might be harmful to native wildlife

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Physical and Chemical				
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Air: Increased airborne particulates	✓	✓	Significant. (1) Construction: Construction activities create dust that reduces air quality in the immediate area; (2) Operation: Truck traffic to/from SWM facilities on unpaved roads creates dust that reduces air quality in the immediate area	<ul style="list-style-type: none"> • Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area • Facilities Management: Require that operators periodically spray water on the access roads to facilities to minimize dust.
Noise: Increased noise levels	✓	✓	Significant. (1) Construction: Construction activities create noise that can interfere with community activities in the immediate area; (2) Operation: SWM facility activities and truck traffic to/from SWM facilities creates noise can interfere with community activities in the immediate area	<ul style="list-style-type: none"> • Engineering and Construction: Prohibit contractors/builder from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities • Facilities Management: Restrict truck loading and unloading in the early morning and late evening.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) of SWM facilities in which organic waste in temporarily or permanently disposed can cause noxious odors.	<ul style="list-style-type: none"> • Planning: Facilities should be sited downwind of settlements and other areas with significant activity • Facilities Management: Solid waste permanently disposed at facilities must be buried to a depth sufficient to prevent odors
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of structures (e.g. fencing, equipment) can obstruct scenic views of the Red Sea and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting
Social and Cultural				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe working conditions	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders and operators must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. LRS project must do unscheduled inspectors to assure safety procedures are followed • Health and Safety: Contractors/builders and operators must certify that all equipment used is in good working order
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper disposal of organic waste attracts flies and other disease vectors	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Interference with social and/or economic livelihoods		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Disruption or damage to archeological sites or artifacts	✓	✓	<i>Significant.</i> Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none"> • Planning: LRS project must assure that any sites planned for construction do no interfere with known antiquities sites • Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated • Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

6.12 Enterprise infrastructure to support income generation and tourism development

The LRS project plans to fund construction of a limited quantity of enterprise infrastructure in targeted communities in the SRS. In all cases, the project will support the planning of infrastructure types and the piloting of specific infrastructure units as models to be replicated with funding and support from non-project sources. Following are brief descriptions of the types of enterprise infrastructure planned and the general locations envisioned.

Upgrading Local Fishing Boats for Tourist Use

There exists already a nascent demand by tourists short excursions into the waters of Sharm Luliyah and Qul'an Bay. However, in order to capitalize on existing demand and spur increased demand, it is necessary to improve the facilities aboard existing fishing boats to (a) guarantee the safety of tourists and crew and (b) provide the amenities tourists expect (e.g. comfortable seating, viewing areas, glass bottoms for undersea viewing, food preparation and potable water storage). The LRS project will fund the improvement of 2-3 fishing boats on a pilot basis.

Table 6.8: Upgrading Local Fishing Boats for Tourist Use

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Damage to coral reefs (from sedimentation)		✓	Significant. Improper operation of tourist boats along sensitive coral reefs can create damage to the coral including (a) anchor damage to reefs; (b) boat collisions with reef; (c) disposal of solid waste on or near reefs.	<ul style="list-style-type: none">• Facilities Management: Require that boat operators are licensed and certify that that will obey GOE regulations regarding boat operation• Training: The LRS project should provide training to boat operators in proper operation• Education and Information Dissemination: Boat operators must provide briefings to passengers regarding safety procedures and proper behavior on the boat (i.e. no throwing waste overboard)
Social and Cultural				
Unhealthy and/or unsafe working conditions		✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to crew and passengers on the boats, and to swimmers, snorkelers and divers in the water.	<ul style="list-style-type: none">• Facilities Management: Require that boat operators are licensed and certify that that will obey GOE regulations regarding boat operation• Training: The LRS project should provide training to boat operators in proper operation• Education and Information Dissemination: Boat operators must provide briefings to passengers regarding safety procedures and proper behavior on the boat (i.e. no throwing waste overboard)

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Destruction and/or interference with traditional cultural practices		✓	<i>Significant.</i> Inappropriate design and/or operation of tourist boats could conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	<i>Significant.</i> Inappropriate operation of tourist boats could conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Handicrafts and Visitors Center

In order to catalyze enterprise development in El Shelateen, the LRS project will fund construction of a building to house handicraft makers and sellers, and to provide information to tourists visiting the city. The building would be constructed on a concrete slab with a footprint not to exceed 100 m². The building would be single story, with water supply, flush toilets and electricity. Water supply would come from a rooftop tank. Sewage would be contained in an underground concrete septic tank constructed next to the building. The septic tank would be empty by truck on a regular basis. The general location planned for this intervention is El Shelateen.

Table 6.9: Handicrafts and Visitors Center

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Although the site that likely will be selected for construction is devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Damage to coral reefs (from sedimentation)	✓		<i>Significant.</i> Although all planned construction would be a minimum of one kilometer from the Red Sea, sedimentation from construction could potentially run off into the Red Sea coastal waters in a significant flash flood event, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Physical and Chemical				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Surface Water: Biological contamination/eutrophication		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.	<ul style="list-style-type: none"> • Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow • Education and Information Dissemination: Signage on the toilets should explain that dumping of any chemicals into the toilets is strictly forbidden
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Although all planned construction would be a minimum of one kilometer from the Red Sea, sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Soil: Increased sedimentation	✓		<i>Significant.</i> Although all planned construction would be a minimum of one kilometer from the Red Sea, construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Soil: Contamination		✓	<i>Significant.</i> Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.	<ul style="list-style-type: none"> • Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow • Education and Information Dissemination: Signage on the toilets should explain that dumping of any chemicals into the toilets is strictly forbidden.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.	<ul style="list-style-type: none"> Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.	<ul style="list-style-type: none"> Planning: Septic tanks should be sited downwind of settlements and other areas with significant activity Engineering and Construction: Septic tanks must be constructed built using impermeable materials Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting
Social and Cultural				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspectors to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites • Education and Information Dissemination: LRS project must provide education in basic sanitation practices for latrines • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Destruction and/or interference with traditional cultural practices		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Disruption or damage to archeological sites or artifacts	✓	✓	<i>Significant.</i> Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none"> • Planning: LRS project must assure that any sites planned for construction do no interfere with known antiquities sites • Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated • Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

Planning of Camel Market and Commercial Market

The existing camel market and commercial market in El Shelateen are relatively effective as venues basic commerce, but neither one is attractive as a tourist destination. However, if these markets were re-planned to organize their activities more efficiently and to provide access to tourist facilities such as shops, cafeterias, public toilets and lodging, they would be an attractive destination for tourists visiting the SRS. The LRS project will not fund construction of any facilities associated with this work. The project's activities would be limited to technical assistance targeted at the Planning of the two markets.

Table 6.10: Planning of Camel Market and Commercial Market

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. It is possible that vegetation could be located on one or more sites for targeted interventions and therefore vegetation could be disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Damage to coral reefs (from sedimentation)	✓		<i>Significant.</i> Although LRS funding will be limited to TA, that TA will lead to construction of facilities and all planned construction would be a minimum of one kilometer from the Red Sea, sedimentation from construction could potentially run off into the Red Sea coastal waters in a significant flash flood event, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Physical and Chemical				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Surface Water: Biological contamination/eutrophication		✓	Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Any septic tanks and drainage fields constructed must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea	<ul style="list-style-type: none"> • Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow • Education and Information Dissemination: Signage on the toilets should explain that dumping of any chemicals into the toilets is strictly forbidden.
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities and all planned construction would be a minimum of one kilometer from the Red Sea, sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Soil: Increased sedimentation	✓		<i>Significant.</i> Although LRS funding will be limited to TA, that TA will lead to construction of facilities and all planned construction would be a minimum of one kilometer from the Red Sea, construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Soil: Contamination		✓	<i>Significant.</i> Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Any septic tanks and drainage fields constructed must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea	<ul style="list-style-type: none"> • Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow • Education and Information Dissemination: Signage on the toilets should explain that dumping of any chemicals into the toilets is strictly forbidden.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Air: Increased airborne particulates	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Construction activities create dust that reduces air quality in the immediate area.	<ul style="list-style-type: none"> Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area
Noise: Increased noise levels	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Construction activities create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities
Odor: Noxious odors		✓	Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities, inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.	<ul style="list-style-type: none"> Planning: Septic tanks should be sited downwind of settlements and other areas with significant activity Engineering and Construction: Septic tanks must be constructed built using impermeable materials Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting
Social and Cultural				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe working conditions	✓		Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspectors to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. Although LRS funding will be limited to TA, that TA will lead to construction of facilities (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites • Education and Information Dissemination: LRS project must provide education in basic sanitation practices for latrines • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Destruction and/or interference with traditional cultural practices		✓	<i>Significant.</i> Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	<i>Significant.</i> Although LRS funding will be limited to TA, that TA will lead to construction of facilities. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none"> • Planning: LRS project must assure that any sites planned for construction do no interfere with known antiquities sites • Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated • Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

6.2 Park Infrastructure and Basic Facilities

WGNP is in its infancy as a *bona fide* destination for visitors. While the RSP has made great strides in terms of increasing ranger presence in the park and improving the overall management of the park's resources, WGNP lacks the basic infrastructure and facilities to provide visitors with a safe and enriching experience and to allow the RSP to effectively management the park's resources over the long term. The LRS project therefore plans to fund the design and construction of basic infrastructure that will provide the foundation for increased quality and quantity of visitor experience and more effective park management. Following are brief descriptions of the physical interventions planned, divided into two subcategories:

- Park Management Infrastructure
- Park Visitation Infrastructure

6.21 Park Management Facilities

Ranger Outposts

In order to effectively monitoring and manage visitor activities in the Park, it is necessary for the park rangers to have a semi-permanent presence at key locations with its borders. The park currently has three operational ranger outposts located at strategic locations within the park. The LRS project plans to fund construction of two additional ranger outposts to create a more effective management network.

These outposts will be constructed using the same design as the existing three outposts. The outposts are constructed using local stone to match the ancient Roman ruins in the area (e.g. Sikait), with minimal amounts concrete mortar and imported wood. The outposts are constructed on leveled ground but without any slab foundation. Each outpost includes a sleeping and work area, plus a separate kitchen building and a separate pit latrine. The outposts are built on rises above wadis or other major transportation corridors to provide rangers with a view of the surrounding area and access to transport the park's internal transport network. Each outpost also includes a covered car park to provide shaded space for two ranger vehicles. The car parks are made from imported or non-native wood and other vegetation. The outposts are equipped with solar photovoltaic (PV) arrays to provide minimal electric power and with a small water tank that is refilled by the rangers when they visit the outpost. Each outpost has a total footprint of approximately 30 m². The general locations for these planned interventions are remote desert locations within WGNP. More specific locations will be determined based on further planning.

Table 6.11: Ranger Outposts

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Vegetation could be located on one or more sites for targeted interventions and therefore vegetation could be disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓		Significant. Given the necessarily remote locations of the ranger outposts, impacts on wildlife habitat are possible.	<ul style="list-style-type: none">• Planning: To the extent possible, outposts should be sited in areas that do not conflict with known wildlife corridors or habitat
Physical and Chemical				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspections to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order

Community Guard Post

The RSP employs local Bedouin as community guards throughout WGNP. Community guards supplement the monitoring capacity of the park rangers, alerting rangers to activities they observe within the park and participating in the RSP's ongoing park management activities. The LRS project plans to fund construction of a rustic shelter for community guards located at Ras Baghdadi to provide shade and protection from the elements. The community guard post will be constructed of non-native wood and thatch with an approximate area of 9m². It will not be equipped with any other services.

Table 6.12: Community Guard Post

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Vegetation could be located on the site of the planned community guard post and therefore vegetation could be disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓		Significant. Given that the community guard post likely would be sited in a coastal location that could be habitat to wildlife, particularly birds, impacts on wildlife habitat are possible.	<ul style="list-style-type: none">• Planning: To the extent possible, outposts should be sited in areas that do not conflict with known wildlife corridors or habitat
Physical and Chemical				
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.	<ul style="list-style-type: none">• Planning: Sites should be selected that do not obstruct important views• Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		<i>Significant.</i> Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none">• Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspectors to assure safety procedures are followed• Health and Safety: Contractors/builders must certify that all equipment used is in good working order
Disruption or damage to archeological sites or artifacts	✓	✓	<i>Significant.</i> Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none">• Planning: LRS project must assure that any sites planned for construction do no interfere with known antiquities sites• Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated• Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

WGNP Headquarters

The RSP is headquartered in Hurghada, some 300+ km north of WGNP's northern border. The RSP also has a permanent ranger presence in two ranger stations at the WGNP borders. One station at the northern coastal border about 50 m south of the Shams Alam resort and one at the southern coast border, just north of Hamatah. These ranger stations, which include work and accommodation space, serve the daily operational needs of the rangers working in the park. However, they do not serve the broader administrative function for park operations. This function largely goes unmet at this time.

Having a central location for park administration, coordination and planning would significantly improve overall park operation and management. Therefore the LRS project plans to provide funding to plan and design an administrative headquarters located in the village of Abu Ghusun, which is approximately in the middle of WGNP, north to south and along the coast. It is possible that the LRS project also will fund a minority percentage, likely no more than 20%, of the headquarters construction in addition to doing the planning and design. No planning or detail work has yet been done for the proposed WGNP headquarters building, but the building and related facilities and grounds would occupy a site of approximately 6,000 m². The building itself would be constructed on a slab, using reinforced concrete and brick. The building likely would be two stories high. It would be equipped with all basic facilities including water supply,

sewerage and electricity. Sewage would drain into a septic tank constructed on concrete and emptied by truck on a regular basis. The building would accommodate a staff of approximately 40 people.

Table 6.13: WGNP Headquarters

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		<i>Significant.</i> Although the site that likely will be selected for construction is devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Damage to coral reefs (from sedimentation)	✓		Significant. The site that likely would be selected is within the municipality of Abu Ghusun, an area where a large phosphates mining operation exists and the fringing reefs are heavily degraded. Regardless, sedimentation from construction could potentially run off into the Red Sea coastal waters in a significant flash flood event, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Physical and Chemical				
Surface Water: Biological contamination/eutrophication		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.	<ul style="list-style-type: none"> • Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow • Education and Information Dissemination: Signage on the toilets should explain that dumping of any chemicals into the toilets is strictly forbidden

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Soil: Contamination		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.	<ul style="list-style-type: none"> • Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow • Education and Information Dissemination: Signage on the toilets should explain that dumping of any chemicals into the toilets is strictly forbidden.
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.	<ul style="list-style-type: none"> • Planning: Septic tanks should be sited downwind of settlements and other areas with significant activity • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting.
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspections to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none"> • Planning: LRS project must assure that any sites planned for construction do no interfere with known antiquities sites • Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated • Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

6.22 Park Visitation Facilities

Solar Power Generation Systems

Because most of the SRS is not connected to the national electric power grid, some communities and remote areas do not have any access to electricity. The LRS project plans to procure and install several pilot solar PV systems, including solar panels, inverters, chargers and distribution wiring in targeted areas within WGNP. The systems will provide minimal electricity to power low voltage applications, such as lights. The general locations planned for these interventions include Qul'an Bay, Sikait, and possibly another location in WGNP. These systems will be similar to those currently installed at three operational ranger outposts in WGNP and proposed for the two additional ranger outposts that the LRS project plans to construct.

Table 6.14: Solar Power Generation Systems

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Physical and Chemical				
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of solar arrays can obstruct scenic views of the Red Sea, eastern desert mountains and other local resources.	<ul style="list-style-type: none">Planning: Solar arrays and other system components should be sited to maximize their ability to capture solar energy while at the same time not interfering with scenic vistas.
Social and Cultural				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspectors to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Elevated Pedestrian Boardwalk

The LRS project concept for Qul'an Bay is to create as little impact on this unique and ecologically sensitive resource as possible while making it an attractive tourist day visit destination. Tourists already visit Qul'an on their own or with tour operators, but these visits are unmanaged and detrimental to the area's fragile natural assets. To accommodate walking along the Bay's long headland above the beach, the LRS project plans to construct an elevated boardwalk to keep visitors away from the edge of the headland. The soil the comprises the headland is unstable and subject to slumping at its edge. This presents a safety hazard as well as causing erosion of the headland onto the beach and mangroves below. The planned elevated boardwalk would be constructed from non-native wood, with pilings set in concrete to secure them to the ground. The boardwalk would be constructed in phases, with an eventual length of approximately 1,000 linear meters.

Table 6.15: Elevated Pedestrian Boardwalk

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. The headlands above the shoreline on which the planned boardwalk would be constructed is essentially devoid of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓		Significant. Because the boardwalk would be built on raised pilings, it would not create an absolute barrier to wildlife movement between the headlands and the shoreline. However, it would create an impediment to movement which could affect native wildlife.	<ul style="list-style-type: none">• Planning: To the extent possible, the boardwalk should be sited in an area that does not conflict with known wildlife corridors or habitat
Damage to coral reefs (from sedimentation)	✓		Significant. Although construction phase soil disruption would be limited to digging holes for the boardwalk pilings, given the steep and unstable slope of the ground between the headlands and the shoreline, sedimentation from construction could potentially run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none">• Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5%• Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site• Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Physical and Chemical				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of the boardwalk could obstruct scenic views of the Red Sea and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting.
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.	<ul style="list-style-type: none"> • Facilities Management: Rangers or their designees must regularly patrol sites to inspect facilities for damage and remove litter • Education and Information Dissemination: Signage prohibiting littering and directing visitors to trash receptacles must be posted
Social and Cultural				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe working conditions	✓		<i>Significant.</i> Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspectors to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order
Unhealthy and/or unsafe conditions for local residents	✓	✓	<i>Significant.</i> Lack of safety procedures and/or equipment can result in accidents and injuries to local residents.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow
Destruction and/or interference with traditional cultural practices		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Nature Trails

To control visitor access to the sensitive ecological areas at targeted locations, the LRS project plans to develop nature trails. These trails would be constructed using rope and stakes to create boundaries within which visitors' movement would be restricted. The general locations planned for these interventions are Wadi el Gimal Island, Sharm Luliyah, Qul'an Bay and Ras Baghdadi.

Table 6.16: Nature Trails

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. The nature trails planned would be developed specifically to steer a path for visitors that avoids sensitive areas, including stands of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Stress on native wildlife	✓		Significant. The nature trails planned would be developed specifically to steer a path for visitors that avoids sensitive areas, including critical wildlife habitat. However, it is possible that conflicts could occur affecting native wildlife as visitors move along nature trails.	<ul style="list-style-type: none"> • Planning: To the extent possible, the trails should be routed to avoid known wildlife corridors or habitat • Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with wildlife.
Physical and Chemical				
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.	<ul style="list-style-type: none"> • Facilities Management: Rangers or their designees must regularly patrol sites to inspect facilities for damage and remove litter • Education and Information Dissemination: Signage prohibiting littering and directing visitors to trash receptacles must be posted
Social and Cultural				
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Vehicle Access Route Demarcation

WGNP has a network of existing vehicle access trails that begin at various points along the coastal highway and generally follow the wadis west into the park's hinterlands. However, some visitors also create their own trails or drive parallel to existing trails, creating additional routes, disrupting vegetation and wildlife and creating safety hazards for themselves and others. In order to control the routes that visitors take within the park, the LRS project plans to demarcate the major existing trails. These route will link major points of interest within the park and will be

receive signage as well. The demarcation will entail placement of small stones from the immediate area along the perimeter of the trails. No grading or other improvement will be made. The LRS project plans to demarcate approximately 70 km of trails throughout WGNP, primarily in the parks desert area. Short stretches of trails also are planned to be demarcated at Qul'an Bay, Sharm Luliyyah and at the camel market in El Shelateen.

Table 6.17: Vehicle Access Route Demarcation

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. The vehicles trails planned for demarcation would be developed specifically to steer a path for visitors that avoids the most sensitive areas of WGNP, including stands of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during demarcation.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓		Significant. Motor vehicle travel through wildlife habitat is by definition disruptive to wildlife. However, the planned interventions will funnel vehicle traffic into designated corridors to keep more of WGNP vehicle free than is currently the case. However, it is possible that conflicts could occur as visitors move along vehicle access routes which could affect native wildlife.	<ul style="list-style-type: none">• Planning: To the extent possible, the vehicle access routes should be routed to avoid known wildlife corridors or habitat• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with wildlife• Education and Information Dissemination: Signage must be posted in areas where vehicle access routes traverse known wildlife corridors and habitat, warning visitors to drive slowly and be alert.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Social and Cultural				
Unhealthy and/or unsafe conditions for local residents	✓	✓	<i>Not Significant – Construction Phase.</i> Demarcation activities will be extremely limited, creating no significant safety hazards. <i>Significant – Operational Phase.</i> During operation, signage limiting vehicle speed and warning of approaching hazards or possible encounters with human populations will be important to prevent accidents.	<ul style="list-style-type: none">• Education and Information Dissemination: Signage must be posted in areas where vehicle access routes cross areas know to be traversed by Bedouin families, warning visitors to drive slowly and be alert.• Education and Information Dissemination: Written information and face to face meetings should be provided by the LRS project and/or the RSP rangers warning Bedouin to be careful for themselves and their livestock near vehicle access routes
Destruction and/or interference with traditional cultural practices		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none">• Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions.• Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none">• Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions.• Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Hiking Trail Demarcation

As with the vehicle trails, WGNP has an existing network of hiking trails. These are used both by park visitors and by local Bedouin who traverse the park. The LRS project plans to demarcate this existing trail network to control visitor access to the park's fragile natural assets. Trail demarcation will include placement of stones from the immediate area at the perimeter of the trails and the addition of signage. No construction will be undertaken as part of this demarcation. The project plans to demarcate approximately 50 km of hiking trails throughout the interior (i.e. desert) areas of WGNP.

Table 6.18: Hiking Trail Demarcation

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. The hiking trails to be demarcated already exist and would be selected specifically to steer a path for visitors that avoids sensitive areas, including stands of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during demarcation.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓		Significant. The hiking trails planned would be developed specifically to steer a path for visitors that avoids sensitive areas, including critical wildlife habitat. However, it is possible that conflicts could occur as visitors move along hiking trails which could affect native wildlife.	<ul style="list-style-type: none">• Planning: To the extent possible, the trails should be routed to avoid known wildlife corridors or habitat• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with wildlife.
Physical and Chemical				
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.	<ul style="list-style-type: none">• Facilities Management: Rangers or their designees must regularly patrol sites to inspect facilities for damage and remove litter• Education and Information Dissemination: Signage prohibiting littering and directing visitors to trash receptacles must be posted

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Social and Cultural				
Destruction and/or interference with traditional cultural practices		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none">• Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions.• Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none">• Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions.• Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Car Parks

Currently visitors to WGNP's various points of interest park informally wherever they choose. Often this means they park on the side of the coastal highway, creating a safety hazard for themselves and others, in ecologically fragile areas, damaging local vegetation, on unstable ground, getting their vehicles stranded or in other inappropriate areas. The LRS project plans to develop several car parks in strategic locations throughout WGNP to reduce these problems. These car parks will not entail any construction of paving work. The work will be limited to grading of the parking areas and demarcation of the parking area boundaries. Each parking area will be a maximum of 2000m². The general locations planned for these interventions include Qul'an Bay, Sharm Luliyah and Ras Baghdadi.

Table 6.19: Car Parks

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Planned car parks would be sited in areas virtually devoid of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓	✓	Significant. Planned car parks would be sited in areas with significant human activity already. However, it is possible that conflicts could occur during construction and operation that could affect native wildlife.	<ul style="list-style-type: none">• Planning: To the extent possible, car parks should be sited in areas that do not conflict with known wildlife corridors or habitat• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to be alert when driving avoid contact with wildlife.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Damage to coral reefs (from sedimentation)	✓		Significant. Although construction will be limited to grading of sites to level the parking area, it is possible that some erosion and sedimentation could occur.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion
Physical and Chemical				
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Although construction will be limited to grading of sites to level the parking area, it is possible that some erosion and sedimentation could occur.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Soil: Increased sedimentation	✓		Significant. Although construction will be limited to grading of sites to level the parking area, it is possible that some erosion and sedimentation could occur.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Air: Increased airborne particulates	✓		Significant. Although construction will be limited to grading of sites to level the parking area, it is possible that some airborne dust could be stirred up from grading of the sites.	<ul style="list-style-type: none"> • Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area
Noise: Increased noise levels	✓		Significant. Although construction will be limited to grading of sites to level the parking area, some additional noise is likely.	<ul style="list-style-type: none"> • Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of the car parks could obstruct scenic views of the Red Sea and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.	<ul style="list-style-type: none"> • Facilities Management: Rangers or their designees must regularly patrol sites to inspect facilities for damage and remove litter • Education and Information Dissemination: Signage prohibiting littering and directing visitors to trash receptacles must be posted
Social and Cultural				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspectors to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order
Unhealthy and/or unsafe conditions for local residents	✓	✓	<p>Significant – Construction Phase. Lack of safety procedures and/or equipment can result in accidents and injuries to local residents.</p> <p>Significant – Operational Phase. During operation, signage limiting vehicle speed and dictating parking rules will be important to prevent accidents.</p>	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites • Facilities Management: All facilities must have written health and safety procedures governing their activities, and necessary safety equipment on site, and necessary safety equipment on site

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Destruction and/or interference with traditional cultural practices		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Disruption or damage to archeological sites or artifacts	✓	✓	<i>Significant.</i> Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none"> • Planning: LRS project must assure that any sites planned for construction do not interfere with known antiquities sites • Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated • Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

Camel Yard

Camel riding is a popular tourist activity throughout much of Egypt. The LRS project plans to fund construction of a small camel yard at Ras Hunkurab where local people can pen their camels for hiring by tourists. The pen would be constructed from imported wood to

accommodate a maximum of 12 animals. The pen would have a footprint not to exceed 80 m². All fodder for the camels would be imports (i.e. non-native vegetation).

Table 6.20: Camel Yard

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓	✓	Significant. The planned camel yard would be sited in an area virtually devoid of vegetation. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓	✓	Significant. The planned camel yard would be sited in an area with significant human activity already. However, it is possible that conflicts could occur during construction and operation that could affect native wildlife.	<ul style="list-style-type: none">• Planning: To the extent possible, the camel yard should be sited in an area that do not conflict with known wildlife corridors or habitat• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to be alert when driving avoid contact with wildlife.
Physical and Chemical				
Surface Water: Biological contamination/eutrophication		✓	Significant. Camel manure must be removed regularly to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.	<ul style="list-style-type: none">• Facilities Management: The camel yard operator must remove camel manure from the camel yard on a daily basis.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Disruption of the soil from animals within the camel presents the potential for some erosion and sedimentation occurring.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Soil: Increased sedimentation	✓		Significant. Disruption of the soil from animals within the camel presents the potential for some erosion and sedimentation occurring.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed structure to assure the ground remains stable and free from erosion
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of the camel yard could obstruct scenic views of the Red Sea, the eastern desert mountains and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓	✓	Not Significant – Construction Phase. Construction will be limited to fencing the camel yard perimeter, presenting no significant safety hazards. Significant – Operational Phase. Lack of safety procedures and/or equipment can result in accidents and injuries to workers and to customers.	<ul style="list-style-type: none">Facilities Management: Require that the operators adhere to basic safety procedures regarding the care and use of camels for recreational purposes, including providing basic information to customers before the begin their excursions
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none">Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions.Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none">Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions.Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Interpretive Signs

WGNP currently has extremely limited signage, both at entry points and within the parks boundaries. In order to attract visitors, and to help ensure their safety and manage their movement within the park, signage is necessary. The LRS project plans to develop a comprehensive signage program that include planning, design, implementation and maintenance of signage throughout the park. The signage itself will be produced locally using local materials to the extent practicable. Areas that will specifically targeted for signage because of their high value as visitor attractions include Wadi el Gimal Island, Sharm Luliyah, Qul'an Bay and Sikait.

Table 6.21: Interpretive Signs

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Physical and Chemical				
Views: Views obstructed/Aesthetic quality diminished		✓	Significant. Poor siting of signage could obstruct scenic views of the Red Sea, eastern desert mountains and other local resources.	<ul style="list-style-type: none">Planning: Signage should be designed and sited to be easily visible to visitors but also be compatible with the natural surroundings in terms of materials, colors and placement
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers and to customers.	<ul style="list-style-type: none">Engineering and Construction: Basic safety procedures regarding the operation of equipment must be observed and the use of safety equipment must be used, when appropriate
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none">Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none">Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Campgrounds

Currently there are no designated campgrounds within the WGNP borders. To the extent that visitors are making overnight stays in the park, they are free to camp wherever they decide regardless of the appropriateness of the site selected. In order to better manage future oversight stays to the park and provide a crucial amenity that international visitors expect in a national park, the LRS project plans to fund establishment of two campgrounds within the park's boundaries – one at the ancient Roman emerald mining site of Sikait and one at the coastal site of Sharm Luliyah (west of the coastal highway). The funding for these interventions would include site planning and design of the campgrounds, leveling of the area for the campgrounds if necessary), demarcation of the campgrounds and specific campsites, and minimal signage. No utilities or other amenities are planned.

Table 6.22: Campgrounds

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Planned campgrounds would be sited in remote parts of WGNP, possibly near vegetation that would provide shade. It is possible that vegetation could be damaged during construction and operation.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓	✓	Significant. Planned campgrounds would be sited in remote parts of WGNP, in areas inhabited by native wildlife. It is therefore possible that conflicts could occur during construction and operation that could affect native wildlife.	<ul style="list-style-type: none">• Planning: To the extent possible, the camel yard should be sited in an area that do not conflict with known wildlife corridors or habitat• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to be alert when driving avoid contact with wildlife.
Damage to coral reefs (from sedimentation)	✓		Significant. Although construction will be limited to grading of sites to level the campground area, it is possible that some erosion and sedimentation could occur.	<ul style="list-style-type: none">• Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5%• Construction: Erosion barriers must be placed around the entire perimeter of the construction site• Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion
Physical and Chemical				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Surface Water: Increased turbidity (from soil sedimentation)	✓		<i>Significant.</i> Although construction will be limited to grading of sites to level the campground area, it is possible that some erosion and sedimentation could occur.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion
Soil: Increased sedimentation	✓		<i>Significant.</i> Although construction will be limited to grading of sites to level the campground area, it is possible that some erosion and sedimentation could occur.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion
Air: Increased airborne particulates	✓		<i>Significant.</i> Although construction will be limited to grading of sites to level the campground area, it is possible that some airborne dust could be stirred up from grading of the sites.	<ul style="list-style-type: none"> • Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area
Noise: Increased noise levels	✓		<i>Significant.</i> Although construction will be limited to grading of sites to level the campground area, some additional noise is likely.	<ul style="list-style-type: none"> • Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities
Views: Views obstructed/Aesthetic quality diminished	✓	✓	<i>Significant.</i> Poor siting of the campgrounds could obstruct scenic views of the Red Sea and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
				<ul style="list-style-type: none"> • Facilities Management: Rangers or their designees must regularly patrol sites to inspect facilities for damage and remove litter • Education and Information Dissemination: Signage prohibiting littering and directing visitors to trash receptacles must be posted
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		<i>Significant.</i> Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspections to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order
Destruction and/or interference with traditional cultural practices		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	<i>Significant.</i> Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Disruption or damage to archeological sites or artifacts	✓	✓	<i>Significant.</i> Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none"> • Planning: LRS project must assure that any sites planned for construction do not interfere with known antiquities sites • Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated • Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

Installation of Mooring Buoys at SRS Dive Sites

Egypt has made tremendous strides in the management of off-shore diving sites through the establishment and maintenance of a comprehensive mooring buoy program through most of its near shore Red Sea territory. In fact, Egypt now has more than 1,000 mooring buoys in place. However, mooring buoy coverage in the SRS remains relatively limited, particularly at key locations that are likely to receive substantially increased levels of tourist activities in the coming years. Therefore the LRS project intend to fund the establishment of mooring buoys off shore at Sharm Luliyah, Qul'an Bay and Wadi el Gimal Island.

Table 6.23: Installation of Mooring Buoys at SRS Dive Sites

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Stress on native wildlife (fish and other marine species)	✓	✓	<i>Significant.</i> Planned mooring buoys have to be properly sited, installed and managed to be effective. A breakdown in any of these area could negatively affect fish and other marine species.	<ul style="list-style-type: none">• Planning: Mooring buoys must be sited to minimize damage to coral and other marine species habitat in terms of their individual placement and the density of mooring buoys in a given area• Engineering and Construction: Mooring buoys must be installed by qualified installation teams (e.g. HEPCA) using accepted best practices• Facilities Management: Rules regarding the number of boats that can be moored to a given buoy at any one time must be obeyed by boat operators and informed by RSP rangers; Buoys must be repaired or replaces as soon as they are reported damaged• Education and Information Dissemination: Boat operators must receive briefings from the LRS project and/or the RSP rangers regarding proper mooring buoy use

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Damage to coral reefs	✓	✓	Significant. Planned mooring buoys have to be properly sited, installed and managed to be effective. A breakdown in any of these area could negatively affect coral reefs.	<ul style="list-style-type: none"> • Planning: Mooring buoys must be sited to minimize damage to coral and other marine species habitat in terms of their individual placement and the density of mooring buoys in a given area • Engineering and Construction: Mooring buoys must be installed by qualified installation teams (e.g. HEPCA) using accepted best practices • Facilities Management: Rules regarding the number of boats that can be moored to a given buoy at any one time must be obeyed by boat operators and informed by RSP rangers; Buoys must be repaired or replaces as soon as they are reported damaged • Education and Information Dissemination: Boat operators must receive briefings from the LRS project and/or the RSP rangers regarding proper mooring buoy use
Physical and Chemical				
Noise: Increased noise levels		✓	Significant. Management of mooring sites is critical to maintaining a tranquil environment at dive sites. Too many boats moored to a buoy, or too many buoys is a given area will create a noise level and general chaos that will significantly diminish the visitor experience.	<ul style="list-style-type: none"> • Planning: Mooring buoys must be sited to minimize damage to coral and other marine species habitat in terms of their individual placement and the density of mooring buoys in a given area • Facilities Management: Rules regarding the number of boats that can be moored to a given buoy at any one time must be obeyed by boat operators and informed by RSP rangers
Social and Cultural				

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe working conditions	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to mooring buoy installation teams, boat crews and boat passengers.	<ul style="list-style-type: none"> Facilities Management: All mooring buoy installation and maintenance teams must be certified and be using equipment that is in good condition; all boats must be licensed and all crews certified Education and Information Dissemination: Boat crews must provide safety briefings to passengers at the start of each excursion
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Planting Native Vegetation

In order to create a more aesthetically appealing environment for visitors and to help stabilize the soil in the area, the LRS project intends to fund procurement and planting of native trees and scrubs at Sharm Luliyah. The number and types of trees and scrubs is to be determined after more detailed planning.

Table 6.24: Planting Native Vegetation

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓	✓	Significant – Construction. New native vegetation must be planted so that it does not interfere with the growth of existing native vegetation. Not Significant – Operation. Once the new trees and scrubs are planted, their would be no ongoing issues related to the existing vegetation.	<ul style="list-style-type: none">Planning: Locations for new trees and plants must be selected so as not to displace or interfere with the growth of existing flora at a given location
Stress on native wildlife		✓	Significant. It is important that only native vegetation is planted so as not to disrupt the feeding patterns of native wildlife.	<ul style="list-style-type: none">Engineering and Construction: Only native trees and scrubs can be planted

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Damage to coral reefs (from sedimentation)	✓		Significant. Although tree and scrub planting will create only very limited disruption to the soil, it is possible that some erosion and sedimentation could occur.	<ul style="list-style-type: none"> Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site
Physical and Chemical				
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Although tree and scrub planting will create only very limited disruption to the soil, it is possible that some erosion and sedimentation could occur.	<ul style="list-style-type: none"> Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site
Soil: Increased sedimentation	✓		Significant. Although tree and scrub plants will create only very limited disruption to the soil, it is possible that some erosion and sedimentation could occur.	<ul style="list-style-type: none"> Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of trees and scrubs could obstruct scenic views of the Red Sea, eastern desert mountains and other local resources.	<ul style="list-style-type: none"> Planning: Sites should be selected that do not obstruct important views

Rehabilitation of Natural Vegetation

Ras Baghdadi is a unique ecological area located at the outlet of Wadi el Gimal along the coast within WGNP. The area has a substantial mangrove stand that is unique for that stretch of the SRS coast. This mangrove stand has been degraded in recent years by camel grazing and other overuse of the resource. In concert with a RSP ranger led mangrove management plan, the LRS project will fund rehabilitation of the mangroves at Ras Baghdadi, including transplant of mangrove trees from established nurseries.

Table 6.25: Rehabilitation of Natural Vegetation

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Stress on native wildlife	✓		Significant. It is important that new saplings are planted so as not to disrupt existing wildlife habitat along the shoreline.	<ul style="list-style-type: none">• Planning: Site selection is critical. Sites must be selected that do not displace or disrupt any existing habitat for marine species living in the shallows• Engineering and Construction: Planting operations must be done by trained individuals knowledgeable about the local ecology

Bird Watching and Observation Platforms

Bird watching has become a worldwide phenomenon in terms of its popularity. The SRS has a number of rare and exotic bird species that already attract both Egyptian and international tourists to the area. However, these visits are in large part unmanaged currently, creating the potential for serious damage to the fragile natural habitats of these unique resources. Three coastal areas, in particular, are thriving and critical habitat for local birds – Wadi el Gimal Island, Qul'an Bay and Ras Baghdadi. In order to help the RSP better manage bird watching and other visits to these sensitive areas, the LRS project plans to fund construction of platforms to provide visitors with good vantage points from which to observe and photograph birds and fauna, while minimizing intrusion and degradation of these fragile ecosystems. The planned platforms would be built from non-native wood, with the height of the platform depending on its location, but not to exceed 3m. Each platform would be built to accommodate approximated eight people at a time. The LRS project plans to construct approximately six platforms total at these three locations.

Table 6.26: Bird Watching and Observation Platforms

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Platforms will be sited to avoid sensitive areas. However, it is possible that vegetation could be located on some part of the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓	✓	Significant. Platforms will be sited to avoid sensitive areas. However, it is possible that wildlife habitat could be disrupted during construction or operation	<ul style="list-style-type: none">• Planning: To the extent possible, the camel yard should be sited in an area that do not conflict with known wildlife corridors or habitat• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to be alert when driving to avoid contact with wildlife.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Damage to coral reefs (from sedimentation)	✓		Significant. Although construction phase soil disruption would be limited to digging holes for the platform pilings, sedimentation from construction could potentially run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion
Physical and Chemical				
<ul style="list-style-type: none"> • Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities 	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of the platforms could obstruct scenic views of the Red Sea and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.	<ul style="list-style-type: none"> Facilities Management: Rangers or their designees must regularly patrol sites to inspect facilities for damage and remove litter Education and Information Dissemination: Signage prohibiting littering and directing visitors to trash receptacles must be posted
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspectors to assure safety procedures are followed Health and Safety: Contractors/builders must certify that all equipment used is in good working order

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to local residents.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites • Facilities Management: All facilities must have written health and safety procedures governing their activities, and necessary safety equipment on site, and necessary safety equipment on site
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs

Beach Park Facilities

Currently there are no visitor facilities in WGNP. Because much of the terrestrial (desert) areas of the park are extremely remote, the need to construct facilities to support visits is not yet critical. However, the coastal locations within the park are easily accessible from the coastal highway, which generally is no more than 500m shoreline. Therefore, constructing facilities to manage the impact of current visitation levels and catalyze increased visitation, the LRS project plans to fund procurement and construction of basic infrastructure including snack bars, beach parasols, park benches and shaded areas. All of these planned interventions will be implemented as part of an overall park infrastructure planning exercise to determine the best placement of facilities and the best systems for operation and management of the facilities themselves. Snack bars would be built of concrete and brick, with concrete slab foundations not to exceed 4m². A maximum of four snack bars is planned (one per location). Park benches would be constructed from poured concrete. Each bench would be placed on a concrete slab foundation not to exceed 1.5m² per bench. A maximum of 20 benches is planned. Parasols and shaded areas would be constructed from non-native wood and other vegetation (e.g. thatch). The numbers for each are to be determined based on specific site requirements. The general locations planned for these interventions include Wadi el Gimal Island, Qul'an Bay, Sharm Luliyah and Ras Baghdadi.

Table 6.27: Beach Park Facilities

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓	✓	Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓	✓	Significant. The locations planned are ecologically sensitive, with unique wildlife resources that could be affected by construction and operation.	<ul style="list-style-type: none">• Planning: To the extent possible, the camel yard should be sited in an area that do not conflict with known wildlife corridors or habitat• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to be alert when driving avoid contact with wildlife.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion
Physical and Chemical				
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion
Soil: Increased sedimentation	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of buildings and other infrastructure can obstruct scenic views of the Red Sea and other local resources.	<ul style="list-style-type: none"> Planning: Sites should be selected that do not obstruct important views Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting
Aesthetics: Litter degrading natural sites		✓	Significant: Failure to adequately manage natural sites with substantial visitation could result in significant degradation of their aesthetic value.	<ul style="list-style-type: none"> Facilities Management: Rangers or their designees must regularly patrol sites to inspect facilities for damage and remove litter Education and Information Dissemination: Signage prohibiting littering and directing visitors to trash receptacles must be posted
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspections to assure safety procedures are followed Health and Safety: Contractors/builders must certify that all equipment used is in good working order

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe conditions for local residents	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to local residents.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites • Facilities Management: All facilities must have written health and safety procedures governing their activities, and necessary safety equipment on site, and necessary safety equipment on site
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none"> • Planning: LRS project must assure that any sites planned for construction do not interfere with known antiquities sites • Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated • Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

Pit Latrines at Beaches

As with other park visitor facilities, there are no public toilets currently located within WGNP. In order to manage the current and increasing park visitation and provide the basic services needed to attract park visitors, the LRS project plans to fund construction of non-flushing latrines at key coastal location that currently attract visitors and that likely will attract increasing numbers of visitors as the park becomes a more popular destination. Approximately six non-flushing pit latrines would be constructed at each location (three for male visitors and three for female visitors), with the six non-flushing pit latrines housed in a single building separated for male and female visitors. Each building would be constructed on a concrete slab foundation not to exceed 10 m². The building itself would be constructed of concrete and brick. Each building would be equipped with a potable water supply (trucked water to be stored in a water tank on the roof of each building) to supply faucets within the building. Waste from each toilet would be collected in an underground sealed septic tank next to the building. The septic tank would be constructed on concrete with an approximate capacity of 3,000 liters. The septic tanks would be emptied by truck on a regular basis. These locations include Wadi el Gimal Island, Sharm Luliyyah and Qul'an Bay.

Table 6.28: Pit Latrines at Beaches

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Biological				
Destruction of vegetation	✓		Significant. Although the sites that likely will be selected for construction are devoid of vegetation, it is possible that vegetation could be located on the site and therefore disrupted during construction.	<ul style="list-style-type: none">• Planning: Sites should be selected that are devoid of vegetation• Engineering and Construction: No vegetation surrounding the site should be damaged during construction• Environmental Management: Any plants that are damaged or destroyed inadvertently during construction should be replaced at a 1 to 1 ratio using native species and in the area immediately surrounding the intervention site• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to avoid contact with and damage to vegetation.
Stress on native wildlife	✓		Significant. The locations planned are ecologically sensitive, with unique wildlife resources that could be affected by construction and operation.	<ul style="list-style-type: none">• Planning: To the extent possible, the camel yard should be sited in an area that do not conflict with known wildlife corridors or habitat• Education and Information Dissemination: Signage must be posted in the vicinity asking visitors to be alert when driving avoid contact with wildlife.

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Damage to coral reefs (from sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity which damages coral by reducing light penetration.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion
Physical and Chemical				
Surface Water: Biological contamination/eutrophication		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.	<ul style="list-style-type: none"> • Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow • Education and Information Dissemination: Signage on the pit latrines should explain proper use and strictly forbid dumping of any chemicals into the latrines
Surface Water: Increased turbidity (from soil sedimentation)	✓		Significant. Sedimentation from construction can run off into the Red Sea coastal waters, increasing turbidity.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Soil: Increased sedimentation	✓		Significant. Construction activities can increase erosion which causes sedimentation.	<ul style="list-style-type: none"> • Planning: Sites should be selected that are on level ground whenever possible; site slope should never exceed 5% • Engineering and Construction: Erosion barriers must be placed around the entire perimeter of the construction site • Environmental Management: To the extent practical, native vegetative cover should be planted around the completed facility to assure the ground remains stable and free from erosion
Soil: Contamination		✓	Significant. Septic tanks and drainage fields must be properly planned, engineered, constructed and maintained to prevent migration of fecal coli form, other pathogens and nutrients into the surrounding soil, and eventually into the Red Sea.	<ul style="list-style-type: none"> • Planning: Sites for septic tanks and drainage fields must be a minimum of 100 m from any groundwater sources • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow • Education and Information Dissemination: Signage on the pit latrines should explain proper use and strictly forbid dumping of any chemicals into the latrines
Air: Increased airborne particulates	✓		Significant. Construction activities create dust that reduces air quality in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Require contractor/builder to place fabric barriers on the sides of structures to minimize the airborne transmission of construction site dust to the surrounding area
Noise: Increased noise levels	✓		Significant. Construction activities create noise that can interfere with community activities in the immediate area.	<ul style="list-style-type: none"> • Engineering and Construction: Prohibit contractors/builders from undertaking loud construction work in early morning, late in the evening or at other times when it interferes with important community activities

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Odor: Noxious odors		✓	Significant. Inappropriate siting (upwind of settlements or other activities) or improper or insufficient emptying of septic tanks can cause noxious odors.	<ul style="list-style-type: none"> • Planning: Septic tanks should be sited downwind of settlements and other areas with significant activity • Engineering and Construction: Septic tanks must be constructed built using impermeable materials • Environmental Management: Septic tanks must be emptied of sludge regularly to prevent overflow
Views: Views obstructed/Aesthetic quality diminished	✓	✓	Significant. Poor siting of building can obstruct scenic views of the Red Sea, eastern desert mountain ranges and other local resources.	<ul style="list-style-type: none"> • Planning: Sites should be selected that do not obstruct important views • Planning: Buildings should be designed and built using architectural styles that create structures complementing and blending into the natural surroundings. Local materials should be used when available. Strong consideration should be given to the colors used, and to the height and specific location of structures so that they fit within the natural setting
Social and Cultural				
Unhealthy and/or unsafe working conditions	✓		Significant. Lack of safety procedures and/or equipment can result in accidents and injuries to workers.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must have written safety procedures that include providing workers with hard hats, protective eyewear and dust masks. Contractors/builders also must have basic first aid kits on site at all times. Contractors/builders also must have basic first aid kits on site at all times. LRS project must do unscheduled inspections to assure safety procedures are followed • Health and Safety: Contractors/builders must certify that all equipment used is in good working order

Category/Impact	Project Phase		Significance	Mitigation Measures
	Construction	Operation		
Unhealthy and/or unsafe conditions for local residents	✓	✓	Significant. (1) Lack of safety procedures and/or equipment can result in accidents and injuries to local residents; (2) Improper cleaning, and improper or insufficient emptying of septic tanks can cause disease from fecal coli form and other pathogens.	<ul style="list-style-type: none"> • Health and Safety: Contractors/builders must fence off construction sites to prevent local residents from entering and suffering injuries • Education and Information Dissemination: LRS project must provide information to local residents regarding the dangers associated with entering construction sites • Facilities Management: All facilities must have written health and safety procedures governing their activities, and necessary safety equipment on site, and necessary safety equipment on site
Destruction and/or interference with traditional cultural practices		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with traditional practices.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Interference with social and/or economic livelihoods		✓	Significant. Inappropriate design, siting or operation of facilities can conflict with social and/or economic livelihoods.	<ul style="list-style-type: none"> • Planning: Avoid any relocation of homes, shops or other important community facilities as part of any planned interventions. • Community Participation: Involve local community residents in the concept, design and implementation of intervention to assure it meets their needs
Disruption or damage to archeological sites or artifacts	✓	✓	Significant. Inappropriate design, siting, construction or operation of facilities can disrupt or damage archeological sites or artifacts.	<ul style="list-style-type: none"> • Planning: LRS project must assure that any sites planned for construction do not interfere with known antiquities sites • Engineering and Construction: Require contractor/builder to report to LRS project any discovery that might be an archeological artifact, and to stop work until discovery is investigated • Facilities management: Facilities operators must report to LRS project any discovery that might be an archeological artifact

Section Seven: Alternatives Analysis

An important difference between the methodology for a typical EA and a PEA is the consideration of alternatives. As mentioned earlier, a typical EA is intervention and site specific, meaning the intervention or set of interventions being proposed is known and the preferred site at which the intervention or set of interventions will be implemented is known. For example, a road is proposed, with a given length and a given right of way. Together these variables provide the dimensions for the road. Additionally, the road is proposed to follow a given route. The EA will examine the preferred alternative – the proposed dimensions of the route and the proposed route. The EA also will examine alternative to the proposed intervention. In the case of a road, typical alternatives would include (a) alternative routes or (b) alternative designs that might avoid environmentally sensitive resources (e.g. using culverts or bridges to span sensitive wetlands). The EA report will recommend the alternative that minimizes negative environmental impacts while still accomplishing the project objective.

As such, USAID environmental procedures for conducting an EA incorporate consideration of alternatives to the proposed intervention, including the no action alternative. For an EA that is examining a specific intervention at a specific location like the road example, this consideration clearly applies. However, in the case of a PEA, neither the interventions nor the locations have been established. Rather, the PEA established the range of acceptable interventions (e.g. a basket of potential interventions) within a given geographic area (i.e. the spatial boundaries of the project area). The specific interventions and specific locations remain to be determined during project implementation. Therefore, conducting an alternatives analysis for specific interventions in the context of the PEA is not applicable.

The PEA mitigation measures themselves will establish the basis for consideration of alternatives. This process will be an integral part of finalizing the interventions at specific sites. For example, if a boardwalk is considered for construction at Qul'an Bay, the mitigation measures associated with this intervention will require the project team to consider alternatives, selecting the one that minimizes negative environmental impacts and accomplished the project objective. This analysis will include consideration of the no action alternative. Using the boardwalk example, one of the mitigation measures associated with construction of the boardwalk is siting the boardwalk in an area that does not interfere with any known wildlife habitat. In order to implement this mitigation measure, the project team will have to eliminate from consideration any alternative sites that would interfere with known wildlife habitat. In this way, the project team will conduct alternatives analysis on an intervention-specific basis.

Therefore the project team would consider a range of alternatives, including the no action alternative, in order to determine the “best” alternative, with the “best” alternative being the one that accomplishes the project objective without leading to any significant environmental impacts. Using the boardwalk example, Figure 7.1 shows the process by which alternatives will be considered, and a final alternative selected.

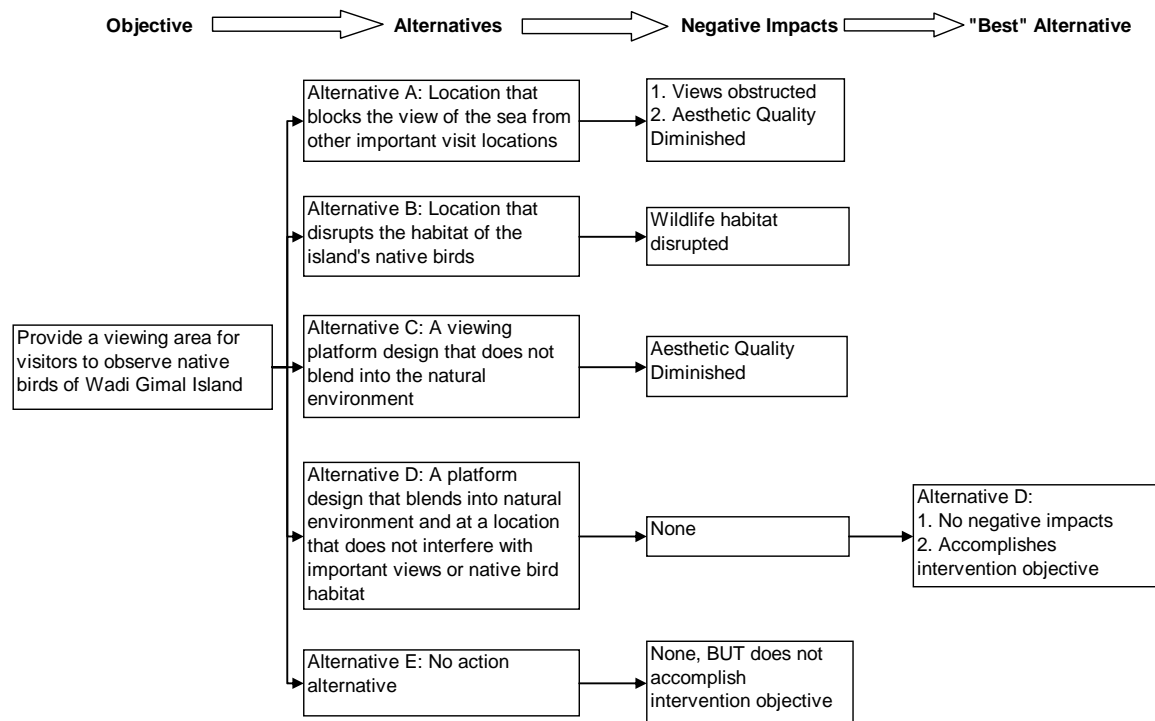


Figure 7.1: Intervention Alternatives Consideration Process Using Recommended Mitigation Measures

Section Eight: Environmental Management Plan

The PEA team has recommended a set of mitigation measures to eliminate or reduce to acceptable levels the potential negative environmental impacts of the LRS project planned physical interventions. These mitigation measures are described in Section Six, *Recommended Mitigation Measures*. In this section, the team presents an Environmental Management Plan (EMP) that will implement the mitigation measures and monitor the environmental performance of the planned physical interventions to determine the effectiveness of the mitigation measures. The EMP also includes cost estimates for implementation of the monitoring plan and other recommended technical assistance and training. A schedule for EMP implementation also is included.

8.1 Implementation of Mitigation Measures

As discussed in Section Six, the recommended mitigation measures represent best practices in seven key areas, including:

- Planning Best Practices
- Engineering and Construction Best Practices
- Environmental Management Best Practices
- Health and Safety Best Practices
- Facilities Management Best Practices
- Community Participation Best Practices
- Education and Information Dissemination Best Practices

These best practices provide the project implementers with a toolbox of actions that they can apply to the full range of physical interventions planned under LRS. Because the final mix of physical interventions and specific site locations has not yet been determined by the LRS project staff in consultation with USAID and the project's three GOE partners, the mitigation measures have been structured to provide flexibility as the decision making process moves forward. The mitigation measures are constructed to address specific negative environmental impacts by applying well-established environmental management principles. Therefore, some mitigation measures are similar, with the same principle being tailored to address two or more specific impacts. Using this methodology, the project implementers can continue to build on the base of mitigation measures established in the PEA, fine-tuning the mitigation regime over the life of the project. The project's Egyptian partners, both governmental and non-governmental, also can use and adapt the mitigation measures toolbox on their other activities, not related to the LRS project.

8.2 Environmental Monitoring Plan

The recommended environmental monitoring plan included indicators for all negative environmental impacts deemed *significant* by the PEA team. The plan is contained in Table 7.1. It is critical that the environmental monitoring plan is implemented. Otherwise, it is not possible to determine whether the recommended mitigation measures effectively eliminate or reduce to acceptable levels any potential negative environmental impacts resulting from LRS physical interventions.

The recommended monitoring plan includes a combination of quantitative and qualitative indicators, biophysical and social indicators. The plan requires active and consistent action by the LRS project GOE partners to succeed, and to be sustained beyond the life of the LRS project. It is therefore important that the LRS project obtain agreement from the relevant GOE partners to take responsibility for specific monitoring activities. The PEA team recommends that the LRS project serve as the monitoring plan coordinating body for the first year of implementation, ceding increasing responsibility to the GOE partners in the later years. Much of the monitoring that is recommended is consistent with the ongoing or planned activities of each GOE partner.

Table 8.1: Environmental Monitoring Plan

Category	Impact	Indicator	Unit of Measure	Frequency	Responsibility
Biological	Flora: Destruction of vegetation	% of vegetative cover in a defined geographic area	Percentage (e.g. vegetative cover)	Annually	RS Protectorate RSG
	Fauna/Terrestrial: Stress on native wildlife	# of sightings of a specific animal species within a defined geographic area	Number (e.g. sightings)	Quarterly	RS Protectorate
	Fauna/Marine: Damage to coral reefs	Change in live coral extent in defined area	m ³ (live coral)	Annually	RS Protectorate
Physical and Chemical	Surface Water: Biological contamination (eutrophication)	1. BOD 2. Coliform bacteria	1. mg/l 2. MPN/100ml	Quarterly	RS Protectorate RSG
	Surface Water: Increased turbidity	Water Turbidity	clear/cloudy/muddy	As needed; linked to construction activity and rain events	RS Protectorate RSG
	Soil: Increased sedimentation	Area covered with sediment	Terrestrial: m ²	As needed; linked to construction activity and rain events	RS Protectorate RSG
	Soil: Contamination	Coliform bacteria	MPN/100ml	Quarterly	RS Protectorate RSG
	Air: Increased airborne particulates	PM	µg/m ³	As needed; linked to construction activity	RSG
	Noise: Increased noise levels	Noise Level	dB (24 hr average)	As needed; linked to construction activity	RSG

Category	Impact	Indicator	Unit of Measure	Frequency	Responsibility
	Odor: Noxious odors	Ambient Odor Level	Low/medium/high over 8 hour period	Monthly	RS Protectorate RSG
	Views: Views obstructed/Aesthetic quality diminished	# of Views obstructed/Aesthetic quality diminished (from baseline survey)	Number of obstructed views	Annually	RS Protectorate RSG
	Diminution of aesthetic/scenic quality of resources ⁵	Tourist Survey Instrument	Survey Data	Annually	RS Protectorate RSG
Social and Cultural	Unhealthy and/or unsafe working conditions	1. Inspection of Safety Equipment (a) at construction sites (b) at completed facilities 2. Review of Safety Procedures (a) at construction sites (b) at completed facilities 3. # of accidents (a) at construction sites (b) at completed facilities	NA	Quarterly	RSG
	Unhealthy and/or unsafe conditions for local residents	1. Inspection of Safety Equipment (a) at construction sites (b) at completed facilities 2. Review of Safety Procedures (a) at construction sites (b) at completed facilities 3. # of accidents (a) at construction sites (b) at completed facilities	NA	Quarterly	RSG
	Destruction and/or interference with traditional cultural practices	Socio-economic and Cultural Survey Instrument	Survey Data	Annually	RSG
	Interference with social and/or economic livelihoods	Socio-economic and Cultural Survey Instrument	Survey Data	Annually	RSG

⁵ Additional general impact not specifically linked to impacts identified during PEA, but important in terms of measuring overall environmental quality over time and consequent attractiveness of area to tourists.

8.3 Training Activities

In order to assure that the monitoring program is successful and sustainable of the long term, the PEA team strongly recommends that the LRS project provide training to GOE staff who will be directly responsible for monitoring activities. The appropriate staff include the RSG Environmental Management Unit (EMU) staff and the RSP rangers. The training should include:

- Terrestrial flora and fauna survey techniques
- Coral reef health monitoring
- Surface and groundwater testing (although neither is required to address specific impacts identified in the PEA, both are fundamental environmental monitoring skills that will undoubtedly be useful in the future)
- Soil testing, for both chemical and biological contamination (although chemical contamination is not identified as an impacts in the PEA, it is another important skill for environmental management)
- Sediment measuring
- Air quality testing
- Noise level testing
- Worker health and safety inspection
- Residential health and safety inspection
- Socio-economic survey techniques

In addition to providing ongoing training in these technical areas, the PEA team recommends that the training program include analytical methodologies for interpretation of monitoring results and strategic planning to adjust project activities based on those results.

8.4 Cost of Environmental Management Plan

The primary costs associated with implementation of the EMP are (a) monitoring and (b) the training program associated with monitoring. All other costs associated with the EMP (e.g. implementation of the mitigation measures) will be integrated into the planning, design, construction and operation of the physical interventions themselves. Following are rough estimates of the costs for each component. All figures are provided in US dollars, although much of the costs likely will be paid in Egyptian Pounds.

- Environmental Monitoring Plan
 - Equipment – Approximately \$50,000 total for the RSP and the RSG EMU
 - Staff Time – Approximately four staff members from each GOE partner, providing one quarter of their time per year. In aggregate, this means approximately one full time equivalent at the mid-level per year, with cost estimated at \$10,000
 - Other Costs (e.g. travel) – Approximately \$5,000 per year
- Training to Support Environmental Monitoring
 - Trainers – Approximately \$40,000 total
 - GOE Partner Staff Time – Approximately \$10,000
 - Training Materials – Approximately \$10,000

The total estimated costs of implementing the EMP is \$125,000 for Year 1, with the cost declining to approximately \$90,000 each year in subsequent years.

8.5 Schedule for Environmental Management Plan Implementation

In order to be effective the EMP must be implemented as soon as the PEA is finalized and approved, with monitoring activities continuing consistently for the operational life of all physical interventions. Following are basic guidelines for scheduling EMP activities.

8.51 Mitigation Measures Implementation

The recommended mitigation measures must be implemented prior to environmental impacts occurring. Therefore, those associated with the pre-construction phase of the project (e.g. planning), must be integrated into the design of the activity before construction begins. Likewise, mitigation measures linked to operational phase environmental impacts must be implemented prior to the start of intervention operation.

8.52 Environmental Monitoring Plan Implementation

In Year 1, the LRS project will have to bear a large part of the responsibility for undertaking monitoring. As the RSP and RSG EMU staff receive training and experience, they are increasingly take the lead.

- **Baseline Data Collection** – It is critical that baseline data are collected prior to implementation of any of the planned physical interventions. As soon as a specific physical intervention is finalized (or a set of interventions that are part of an integrated development scheme) and before any construction begins, a baseline data survey including all relevant indicators is required.
- **Implementation Monitoring** – Monitoring should be done with the frequency stated in the monitoring plan, throughout the construction and/or operational phase of the project, as appropriate.

8.53 Environmental Monitoring Training Program Implementation

The EMP training program should be implemented as soon as possible. Design of training modules might even precede final approval of the PEA, in cases where training activities could be justified to support other LRS activities. It is important that the training program be underway prior to the implementation of any project physical interventions. Ideally, an initial round of training for all indicators should be completed by the time final decisions are made on the design of specific physical interventions. This will allow designated staff from the RSP and the RSG EMU to actively participate in the baseline data collection phase of the monitoring plan.

Annex A: List and Brief Descriptions of PEA Team members

List and Brief Descriptions of PEA Team members

The LRS PEA approach was multi-disciplinary, with a team comprised of specialists with the technical and institutional expertise to address all issues relevant to the completion of the assessment and preparation of the report.

The PEA team was led by Chris Perine, an environmental impact assessment specialist who has prepared Environmental Assessments and other document associated with USAID's environmental procedure (22 CFR 216) for a range of projects including roads, bridges and culverts; flood proofing infrastructure; agricultural infrastructure; and industrial estates. These projects were located in Bangladesh, Cambodia, Egypt, India, Indonesia, Nepal and the West Bank and Gaza.

Additional technical support for the LRS PEA was provided by:

Mr. Ali Nasser , EIA

Ms. Dalia Nakhla, EIA

Dr. Somaya Ibrahim, Social and Cultural Aspects

Dr. Mahmoud Hanafy, Marine Ecosystems

Mr. John McEachern, Park Infrastructure Planning

Mr. Assem El Gazzer, Community Infrastructure Planning

Mr. Hani El Nahlawy, GIS

Ms. Katrina ole-MoiYoi, Technical Editor

Annex B.1: LIFE Program Approved IEE

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
CAIRO, EGYPT

DATE: September 1' 2003

FROM : Seifalla Hassanein DIR/OFF: EI/E
TELEPHONE : 202-522-6719 X 6719
FAX : 202-516-5338

TO : John Wilson
ORGANIZATION: ANE/SEA/SPA
COUNTRY : USA STATE: WASHINGTON, DC
FAX NO. ; (202)-216-3171 TELEPHONE: (202)712-4633

SUBJECT:

Attached for your approval is the Initial Environmental
Examination for Livelihoods and Income from the Environment
(LIFE).

Thanks.

Regards,

Seifalla Hassanein
EI/E

Attachments: a/s

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U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
BUREAU FOR ASIA AND THE NEAR EAST
WASHINGTON, D.C. 20523

ENVIRONMENTAL THRESHOLD DECISION

PROGRAM/ACTIVITY DATA:

Program/Activity No:

Country/Region: Egypt

Program/Activity Title: Livelihoods & Income from the Environment (LIFE) program

Funding Begin: FY 04

Funding End: FY 07

LOP Amount: \$16 M/ \$102 M Egyptian
Pounds

Sub-Activity Amount:

IEE Prepared by: Seifalla Hassanein, MEO

Date: August 2003

IEE Amendment (Y/N): N

If "Yes," Number @ Date of Original IEE:

ENVIRONMENTAL ACTION RECOMMENDED: (Place X where applicable)

Categorical Exclusion: ☒

Negative Determination: ☐

Positive Determination: ☒

Deferral: ☐

SUMMARY OF FINDINGS

Through the Livelihoods and Income from the Environment (LIFE) project, USAID/Egypt will support improved water resources management, sustainable economic growth of the Red Sea Governorate, and lead smelter remediation. The program will be implemented through a mix of education, technical assistance, and training combined with other classes of actions (irrigation, wastewater management, infrastructure development, industrial site remediation) that have the potential for significant environmental impacts. The IEE recommends Categorical Exclusions for education, technical assistance, and training programs and Positive Determinations for (1) irrigation rehabilitation, sewage treatment, and wastewater management; (2) infrastructure construction and solid waste clean-up; and (3) lead smelter remediation. Scoping Statements will be prepared for review and approval by the ANE Bureau Environmental Officer prior to initiation of Environmental Assessments for these latter program components.

APPROVAL OF RECOMMENDED ENVIRONMENTAL ACTIONS:**CLEARANCE:**Associate Director, EI: (signed)
Anthony Vance

Date: September 1, 2003

CONCURRENCE:Bureau Environmental
OfficerJohn O. Wilson
John O. Wilson

Date: September 2, 2003

Approved: ☒Disapproved: ☐

File No: ANE 03-53

DISTRIBUTION:Mission Environmental Officer
IEE File

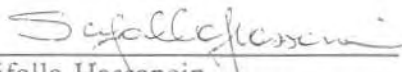


CAIRO, EGYPT

UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

***THRESHOLD DECISION
BASED ON INITIAL ENVIRONMENTAL EXAMINATION***

1. **Project Location:** Egypt
2. **Project Title/ID:** Livelihoods and Income from the Environment (LIFE)
3. **Funding (Fiscal Year and Amount):** FY 04 - FY 07,
\$16 million/102 million Egyptian pounds
4. **Prepared By:** **Date:**


Seifalla Hasanein
Mission Environmental Officer

2.11.03

5. **Action Recommended:**

5.1. **Water Resources Management:**

- a) The design, technical assistance, education and training elements of subcomponents (1), (2), (3), (4), (5), and (6): Categorical Exclusion pursuant to 22 CFR, Part 216.2 (c)(2)(i);
- b) The irrigation canals maintenance activity of subcomponent 1; the management of septic tanks activity in subcomponent 4; and the irrigation of crops using wastewater activity in subcomponent 5: Positive Threshold decision pursuant to 22 CFR, Part 216.2 (d)(2) and an Environmental Assessment is required.

5.2. **Sustainable Economic Growth of the Red Sea Governorate:**

- a) The technical assistance, education and training activities under subcomponents (1), (2), (3), and (4): Categorical Exclusion pursuant to 22 CFR, Part 216.2 (c)(2)(i);
- b) The small loans activity under subcomponent (1): Received Categorical Exclusion previously on December 3, 2002;

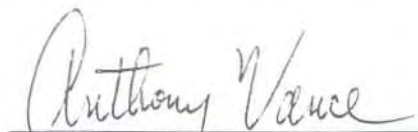
- c) The construction and physical intervention activities under subcomponent (2); and, the solid waste clean-up activities under subcomponent (3): Positive Threshold decision pursuant to 22 CFR, Part 216.2 (d)(2) and an Environmental Assessment required.

5.3. Lead Smelter Remediation:

- a) Design, technical assistance, education and training activities: Categorical Exclusion pursuant to 22 CFR, Part 216.2 (c)(2)(i);
- b) Implementation of the Remediation Plan activity: Positive Threshold Decision pursuant to 22 CFR, Part 216.2 (d)(2) and an Environmental Assessment is required.

Associate Director's Concurrence:

Date:



Anthony Vance
Associate Director, EI

Sept. 1, 2003

Decision of Environmental Coordinator,
Bureau for Asia & Near East:

Approve: (see attached page)

Disapprove: _____

Date: _____

Clearances:

RHagan, EI/E
AGamalElDin, EI/EE
HFerrette, EI/EE
MSmith, LEG
REdwards, EI/E/OD

<u>REH</u>	date	<u>8/12/2003</u>
<u>AGamalElDin</u>	date	<u>7/14/2003</u>
<u>HF</u>	date	<u>8/14/2003</u>
<u>MSmith</u>	date	<u>9/1/03</u>
<u>RE</u>	date	<u>8/14/03</u>

- (c) The construction and physical intervention activities under subcomponent (2); and, the solid waste clean-up activities under subcomponent (3): Positive Threshold decision pursuant to 22 CFR, Part 216.2 (d)(2) and an Environmental Assessment required.

3.3. Lead Smelter Remediation:

- (a) Design, technical assistance, education and training activities: Categorical Exclusion pursuant to 22 CFR, Part 216.2 (c)(2)(i);
- (b) Implementation of the Remediation Plan activity: Positive Threshold Decision pursuant to 22 CFR, Part 216.2 (d)(2) and an Environmental Assessment is required.

Associate Director's Concurrence:

Date:

Anthony Vauve
Anthony Vauve
Associate Director, EI

Sept 1, 2003

Decision of Environmental Coordinator,
Bureau for Asia & Near East:

Approve: Joc O Wilson

Disapprove: _____

Date: Sept 2, 2003

Clearance:

RHagan, ELP

AGarnett/Din, E/EE

HFeinberg, E/EE

MSmith, ELC

RPeterson, E/EE, OD

REAT date 8/13/2003
AGarnett/Din date 8/14/2003
HFeinberg date 8/14/2003
MSmith date 9/1/03
JPeterson date 8/14/03

Annex B.2: LIFE Red Sea IEE Amendment Approving PEA Approach

Discussion
of
Major Environmental Relationships
and
Environmental Action Recommended

This Results Package (RP) will fund the Livelihoods and Income from the Environment (LIFE) Project. This project includes three major components: water resources management, sustainable economic growth of the Red Sea Governorate, and lead smelter remediation. The total activity budget is \$16 million/102 million Egyptian pounds and the activity duration is two to four years. The RP includes the following components:

1. **Water Resources Management:** The proposed funding for the water resources management component is \$8.4 million (\$5.0 million ESF, and local currency equivalent of \$3.4 million). This component includes the following subcomponents:
 - 1) **Irrigation System Maintenance:** This subcomponent includes technical assistance, and training programs. In addition, the subcomponent includes inspection, repair, and maintenance of irrigation canals and agricultural drains. Maintenance of irrigation canals will include the collection of vegetation, plastic and garbage from the canals and the disposal and recycling of the garbage and vegetation collected. This activity will be undertaken in two geographic areas: Luxor in Upper Egypt, and Zefta in the Delta.
 - 2) **Water Allocation for Equity:** This subcomponent includes only technical assistance and training activities.
 - 3) **Repair and Maintenance of Water Equipment:** This subcomponent includes technical assistance, training programs, and the provision of some equipment to workshops that work on the repair of water pumps.
 - 4) **Water Quality Management.** This subcomponent includes technical assistance and training activities. In addition, the subcomponent includes managing septic and sewage tank effluents in targeted districts, which includes transportation and disposal of untreated wastewater in wastewater treatment plants.

- 5) Enterprise Development. This subcomponent includes technical assistance, and training programs. In addition the subcomponent includes enterprise development for alternative crop production using wastewater treatment plants effluents to grow cut flowers, landscaping, and household plants. The subcomponent will also investigate alternative crop production using non-traditional water sources, planting techniques, and crops, including greenhouses, etc.
- 6) Stakeholder Awareness, Education, Outreach, and Participation with Technical and Business Management Skills Development: This subcomponent includes only education, technical assistance, and training programs.

Subcomponents (1), (2), (3), (4), (5), and (6) include education, technical assistance or training activities that have no impact on the physical and natural environmental and that qualify for a Categorical Exclusion pursuant to 22 CFR, Part 216.2 (c)(2)(i): "Education, technical assistance or training programs except to the extent such programs include activities directly affecting the environment".

The irrigation canals maintenance activities of Subcomponent 1 is an irrigation activity which pursuant to 22 CFR, 216.2 (d)(1)(ii): "Irrigation or water management projects, including dams and impoundments", fall under the classes of actions that normally have a significant effect on the environment. Accordingly, the Mission recommends that a Positive Threshold Decision be recorded for this activity pursuant to 22 CFR, Part 216.2 (d)(2) and that an Environmental Assessment of the impacts of the proposed activities be undertaken.

The management of septic and sewage tank effluents activities under subcomponent 4, and the irrigation of crops using wastewater treatment effluents activity under subcomponent 5 are sewerage activities. Sewerage projects, pursuant to 22 CFR, 216.2 (d)(1)(xi): "Potable water and sewerage projects other than those that are small scale", fall under the classes of actions that normally have a significant effect on the environment and therefore these activities require an Environmental Assessment. Accordingly, the Mission recommends that a positive threshold decision be recorded for these activities pursuant to 22 CFR, Part 216.2 (d)(2) and that an Environmental Assessment of the impacts of the proposed activities be undertaken.

2. Sustainable Economic Growth of the Red Sea Governorate: Proposed funding for the Sustainable Economic Growth of the Red Sea Governorate component is \$46 million Egyptian Pounds and \$6.70 million. The goal of this component is to improve tourism management to achieve maximum sustainable economic benefit of Red Sea natural and cultural assets and equitable distribution of these benefits. To achieve this goal this component will: engage local Red Sea populations; enhance competitiveness of Egypt in the international tourism market; and, ensure protection, management and sustainable use of the natural and cultural assets upon which the Red Sea tourism industry and local livelihoods are based.

This component includes the following subcomponents:

- 1) Business Development in Natural and Cultural Tourism Subcomponent: This subcomponent will involve working with relevant governmental and non-governmental entities in Egypt to develop a tourism market based on the natural and cultural assets of the Red Sea Governorate. It will also help local residents create, and existing tourism industry members expand into new businesses and services that are natural and cultural resource-based. To achieve its objectives, this subcomponent will provide technical assistance, training and small loans;
- 2) Integrated Conservation and Development of Southern Red Sea Zone Activity: This subcomponent will provide basic infrastructure, services and jobs to communities within, and adjacent to, the recently declared Wadi El-Gemal-Hamata Protected Area in the southern Red Sea Zone. The subcomponent will also provide support for the implementation of protection plans in the southern Red Sea Sector and the Wade Jimal park. In addition, this subcomponent will assist central and local government and non-governmental agencies to manage tourism and the natural and cultural resource base so that their values can be maintained. To achieve its objectives this subcomponent will provide technical assistance, education and training. The subcomponent will also implement some infrastructure, roads and tracks, and some necessary construction activities in the wade Jimal park and in adjoining villages and towns. This activity may also include some alliances with U.S. universities, parks or other relevant entities;
- 3) Job Opportunities from Environmental Clean-up Activities: This subcomponent will create jobs for local community members to clean-up and, where possible and appropriate, restore to a natural state, amenities of the Red Sea such as beaches, wadis (valleys), roads, coral reefs and villages, in order to enhance visitor experience and promote healthy living conditions. This subcomponent will also work on the related task of implementing proper management of dump sites in the southern Red Sea zone.
- 4) Environmental Education, Awareness and Communication Activities: This subcomponent will provide strategic and targeted education, awareness and communication activities in order to encourage behaviors that promote the protection and sustainable use of Red Sea resources. As part of this activity, an existing environmental awards program in the Red Sea Governorate will be expanded to work with all schools and a broader range of community organizations.

The technical assistance, education and training activities in subcomponents (1), (2), (3), and, (4) have no impact on the physical and natural environmental, therefore, the Mission recommends a Categorical Exclusion for these activities pursuant to 22 CFR, Part 216.2

(c)(2)(i): "Education, technical assistance or training programs except to the extent such programs include activities directly affecting the environment".

Subcomponent (2) includes construction activities to provide infrastructure and services to some low income communities in the southern Red Sea sector, and to provide the necessary infrastructure for the Wade Jimal park. Subcomponent (3) includes solid waste collection and disposal activities in the environmentally sensitive area of the southern Red Sea sector. Both the construction activities in subcomponent (1) and the solid waste activities in subcomponent (3) are physical interventions that will be undertaken in environmentally sensitive marine and terrestrial areas and therefore these activities could have a significant impact on the natural and physical environment. Pursuant to 22 CFR, 216.2 (d)(1)(vi): "New lands development", and 22 CFR, 216.2 (d)(1)(viii): "penetration road building or road improvement projects", physical interventions activities in the southern Red Sea sector under subcomponents (1) and (3) fall under the classes of actions that normally have a significant effect on the environment and require an Environmental Assessment. Accordingly, the Mission recommends that a positive threshold decision be recorded for these activities pursuant to 22 CFR, Part 216.2 (d)(2) and that an Environmental Assessment of the impacts of the proposed activities be undertaken.

Subcomponent (1) will provides small scale enterprise loans for tourism related businesses through the DCA program – Environment Sector Support which has already received a Categorical Exclusion from the Bureau Environmental Officer on December 3, 2002.


3. Lead Smelter Remediation: Proposed funding for the Lead Smelter Remediation component is \$6 million and includes the following activity:

Remediation of five lead smelters/foundries in Shoubra El Kheima, Qalubiya Governorate (Remediation contract). This contract includes deciding on the most appropriate technical alternatives for remediation ranging from on-site air quality monitoring to demolition of the buildings. Depending on the chosen alternative per site other activities would be undertaken like hazard classification of the debris and soils, acid wash and salvage of the equipment in the smelters, excavation of soils inside the borders of the smelters, transporting hazardous debris and soils to appropriate landfills for disposal, transporting non-hazardous waste debris and soils to solid waste landfill in Greater Cairo area, backfill of the clean soils, asphalt or other surface cover, and new site fence construction, etc. The activities under this contract fall under the category of activities that normally have a significant effect on the environment under 22 CFR, Part 216.2 (d)(1)(x): "Industrial plants". Accordingly, the Mission recommends that a positive threshold decision be recorded pursuant to 22 CFR, Part 216.2 (d)(2) and that an Environmental Assessment of the impacts of the proposed activities be undertaken.

The design, technical assistance, public participation, education and training elements of this component include the preparation of the environmental assessment and will not have an impact on the natural and physical environmental and therefore qualify for a Categorical Exclusion pursuant to 22 CFR, Part 216.2 (c)(2)(i): "Education, technical assistance or

training programs except to the extent such programs include activities directly affecting the environment".

As with all USAID-funded projects, and pursuant to 22 CFR 216.3(a)(9), if new information becomes available which indicates that any of the proposed actions to be funded by this project might be "major" and their effects "significant," the threshold decisions for those actions listed above will be reviewed and revised by the BEO and an environmental assessment prepared by the Mission, as appropriate.

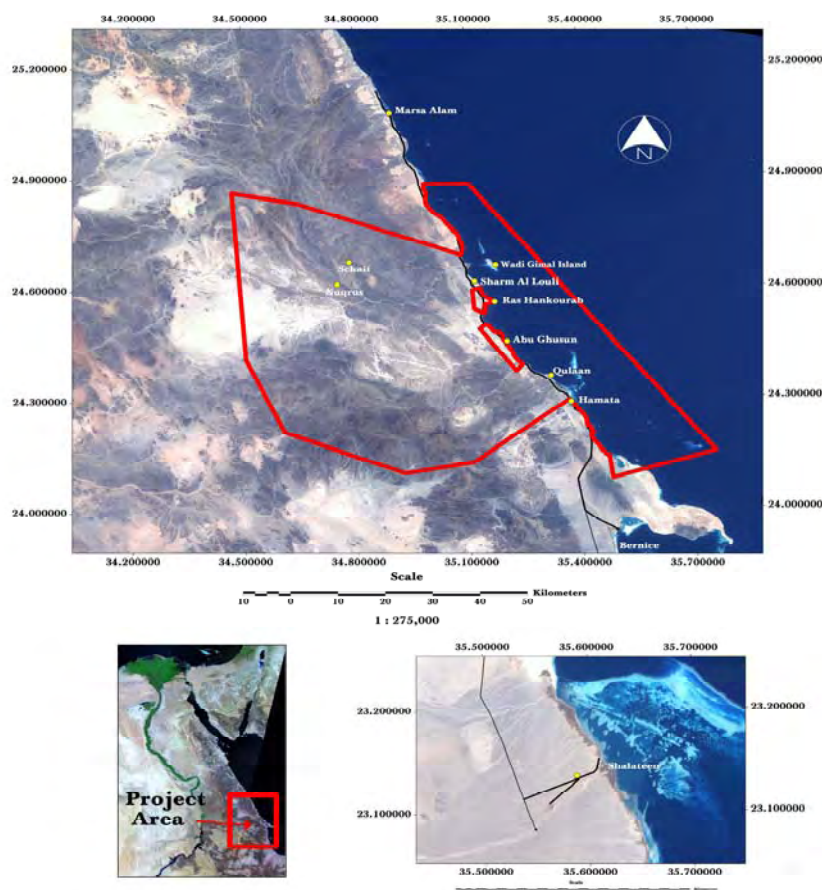

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Annex C.1: LIFE Red Sea Scoping Statement



USAID
FROM THE AMERICAN PEOPLE

EGYPT



SCOPING STATEMENT PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

LIFE RED SEA PROJECT

FEBRUARY 2006

This publication was produced for review by the United States Agency for International Development. It was prepared by authors and/or organizations involved in the preparation of the report.

SCOPING STATEMENT PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

LIFE RED SEA PROJECT

Contract No. GS-23F-9800H

DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency of International Development or the United States Government.

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ABBREVIATIONS AND ACRONYMS

a.s.l.	Above sea level
CAA	Competent Administrative Authority
CBFL	Coastal Building Front Line
CDA	Community Development Association
EA	Environmental Assessment
EEAA	Egyptian Environmental Affairs Agency
EIA	Environmental Impact Assessment
EMU	Environmental Management Unit
ERs	Executive Regulations
IDC	Integrated Development center
LRS	LRS
NPD	Nature Protection Department
PEA	Programmatic Environmental Assessment
RSG	Red Sea Governorate
SPA	Shore Protection Authority
SRS	Southern Red Sea
TDA	Tourism Development Authority

1 Introduction

The LIFE Red Sea (LRS) project focuses on increasing sustainable economic growth in the Red Sea Governorate by promoting sustainable tourism. The project builds on prior efforts and addresses the key challenges for the sustainable development of the Egyptian Red Sea. Tourism is the main economic activity in the southern Red Sea, based on the area's exceptional natural resources. Environmental degradation, however, has accompanied the rapid growth of tourism in this governorate, particularly in Hurghada. If resource quality continues to decline, tourists will increasingly choose other destinations.

The LRS project is helping ensure the sustainability of present and future uses of the southern Red Sea area's natural and cultural resources in compliance with best practices and conservation management principles. The project works with three Government of Egypt partners, namely: the Egyptian Environmental Affairs Agency (EEAA), the Tourism Development Authority (TDA), and the Red Sea Governorate (RSG). The project's geographic focus is the Southern Red Sea Zone, with, terrestrial/desert, coastal and marine sites identified for possible interventions. Project activities include technical assistance, training, procurement of equipment and physical infrastructure development.

The LRS project's physical development activities, which will require the construction of infrastructure facilities, necessitate the completion of an Environmental Assessment (EA), pursuant to USAID's Environmental Procedures (22 CFR 216 or Regulation 216). Based on the nature of the proposed activities and the level of detail currently at hand about these activities, a Programmatic Environmental Assessment (PEA) approach has been adopted for meeting Regulation 216 requirements and developing a process that assures the environmental soundness of project-funded construction activities. PEA is described in Section 216.6(d) of the USAID Environmental Procedures and is appropriate for the assessment of a group of individual actions.

The PEA will result in a set of best practices for engineering and management of all constructed facilities, and a set of mitigation measures to address all potential negative environmental impacts of proposed interventions. In addition, the PEA will include an environmental monitoring plan that will be integrated with the LRS's existing project Monitoring and Evaluation Plan, to provide long term environmental monitoring of all project interventions. The "toolbox" of best practices and mitigation measures will serve as a model for similar physical interventions on other sensitive lands in Egypt.

Under USAID environmental procedures it is necessary to carry out a Scoping Process including the following steps:

1. Conduct scoping sessions, involving relevant stakeholders (these sessions may include a formal scoping session, informal scoping meetings or some combination of both);
2. Draft a Scoping Statement.

1.1 Specific Objectives of the Scoping Phase

The core objective of the scoping process is to identify potentially significant environmental issues related to proposed LRS project interventions in order to determine the scope of issues to be addressed in the PEA. Along with determining the issues to be addressed in the PEA, the scoping process specifically and methodically identifies issues that are not significant and which will not be addressed in the PEA. In order to achieve this objective, the scoping process involves a number of specific steps, including:

- Identifying stakeholders of the proposed project interventions (in addition to those already identified based on the legal and administrative/institutional framework of the proposed action);
- Organizing and carrying out meetings with potential stakeholders within the broad geographic boundary of the study area as well as within each focus area;
- Identify environmental issues or concerns of the stakeholders; and
- Identifying sources of information and available data relevant to the proposed project interventions.

The Scoping Statement serves as the scope of work for the PEA, providing the issues, approach and methodology, schedule and technical disciplines for completion of the PEA.

1.2 Approach and Methodology

USAID's environmental procedures require completion of a scoping process. Often the centerpiece of that process is a large scoping session, involving as many of the project stakeholders as possible. In this case, it was deemed more practical and more useful to replace the traditional scoping session (the one big session) with a series of smaller scoping sessions and focused meetings with the various stakeholders in their relevant locations. The rationale for this approach was based on the following considerations:

- The project geographic area is relatively large and sparsely inhabited. It therefore was not practical to bring together important stakeholders in one location, particularly nomadic Bedouins whose input to the scoping process was critical
- Organizing a meeting that brings together all the necessary GOE representatives is extremely difficult, given their conflicting schedules and their different locations (i.e. EEAA and TDA based in Cairo, RSG based in Hurghada)
- Many of the key stakeholders, particularly the Bedouins, would likely not attend a formal scoping session with high government officials present. And to the extent any of them would have attended, they very likely would not have felt comfortable expressing freely their opinions.

Using this approach allowed the team to target their presentation of the project and their questions to the specific group with whom they were meeting. The team worked with the LRS project staff and representatives of each of the three GOE partners to insure that they identified and met with all relevant project stakeholders. The PEA team is completely satisfied with the results of this process, having had enthusiastic and thoughtful discussion and comments from stakeholders during their various meetings.

The relevant stakeholders were identified based on a review of the proposed interventions, the legal and institutional framework of the project and the EA requirements under USAID's environmental procedures. In cooperation with project staff and with assistance from the Southern Red Sea Nature Protection Office staff and the Red Sea Governorate, plans were developed to arrange meetings in Cairo and in various locations within the Red Sea Governorate. The scoping approach included meeting representatives of all stakeholders identified in the process and arranging for other necessary activities to achieve the overall aim of the scoping exercise (i.e. field visits).

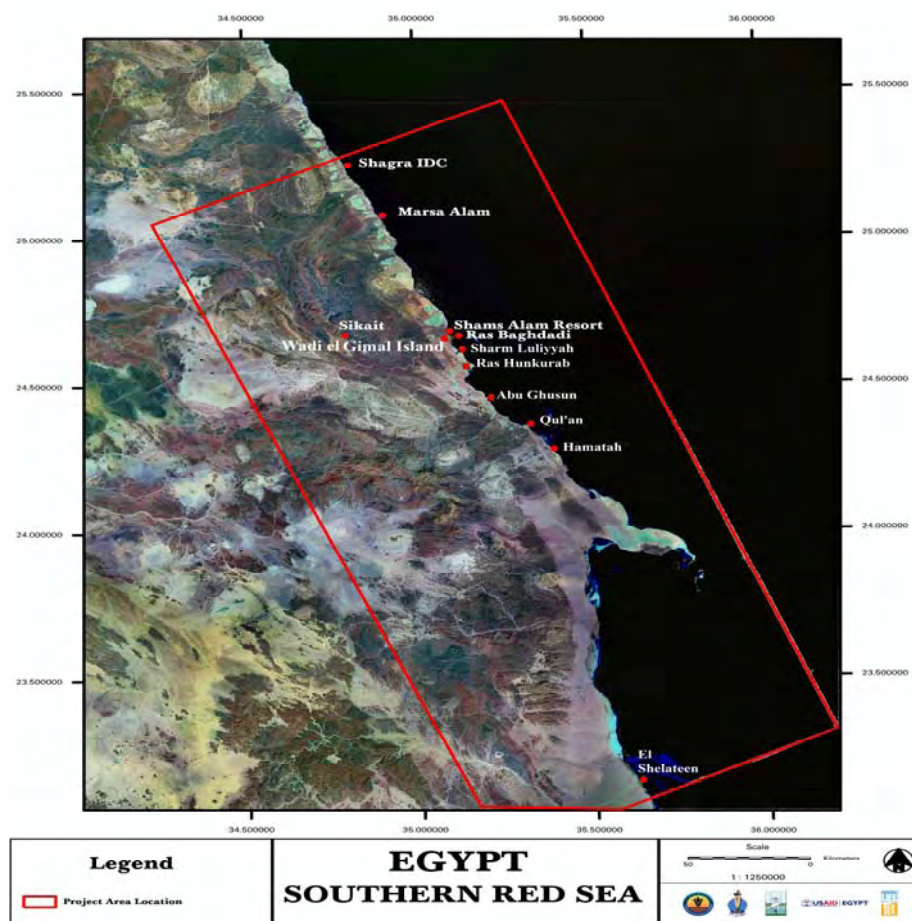
The scoping methodology combined semi-structured individual interviews and focused group discussions. The semi-structured interviews were conducted with RSG, TDA, EEAA and the Executive Boards of prominent community development associations (CDAs) located in Marsa Alam, Hamatah, and Shalateen. The focus group discussions were carried out with members of the local communities, including Bedouin groups. These activities were carried out either in official

offices or in the specific geographic locations where the interventions are proposed. Meetings and interviews with the locals were carried out using simple and clear language while observing their own unique tribal customs.

1.3 Proposed Project Interventions & Geographic Coverage

1.3.1 The Project Area

The project area is generally defined as the area from Ras Toronbi in the north (73 km north of Marsa Alam) to the Egyptian-Sudanese border in the south, with all of the project area within 10 km of the coastline, except the area within Wadi Gemal National Park. The core of the project area is the geographic area within and adjacent to Wadi Gemal National Park (WGNP), including four significant population centers in the Southern Red Sea – Marsa Alam, Abu Ghusun, Hamatah and Shalateen. Except for Abu Ghusun, all of these population centers are outside the boundaries of the Park, but their populations and their economic activities directly impact the Park. All project activities are located within the southern part of the Red Sea Governorate. Figure 1.1 is a map showing the project area.



The Red Sea Governorate is divided administratively into six city councils of Ras Ghareb, Hurghada, Qusseir, Safaga, Marsa Alam and Shalateen. The geographical scope of the study is limited to the administrative centers of Marsa Alam and Shalateen. Several communities along the coast and inland fall within the jurisdiction of these two administrative centers. Following is a brief summary of the relevant communities within the project area. The total population covered by the project area (which covers the Park and adjacent areas) is 7,800 inhabitants.

Figure 1.1: Project Area

Wadi Gemal National Park

Wadi Gemal National Park is a recently established marine and terrestrial protectorate in the Southern Red Sea, located 325 km south of Hurghada, the protectorate includes a marine component of 1,600 km², and a terrestrial component of 4,400 km². The Park includes approximately 100 km of coastline, extends eastward approximately 15 km into the sea, and extends around 55 km into the mountainous hinterland. Its northern and southern coastal borders are at the Shams Alam resort and the village of Hamatah, respectively. There is a ranger station located at both the northern and southern boundaries. The Park includes a number of islands (e.g. Wadi Gemal Island), numerous fringing and offshore reefs, a number of valleys (wadis), and some antiquities sites. The Park also includes a number of small housing settlements (e.g. Abu Ghusun, Qul'an, and Hamatah) and a number of hotels. The housing settlements are inhabited mainly by native tribes and migrants from nearby governorates in Upper Egypt. The total population inside the protected area is approximately 1,000 inhabitants.

The LRS project proposes a range of small scale basic infrastructure within the Park to facilitate better management of the Park's resources and promote managed visitation. A complete list of the planned types of interventions is included in Table 1.1.

Wadi El

Wadi El, which is inhabited by a community of 15 families (about 90 individuals), lies around 55 km to the south of Marsa Alam, just inside the northern boundary of WGNP. Because of its wildlife and abundant mangroves, Wadi El has been declared a Protectorate. The nearby Shams Alam resort employs about 30% of the community as gardeners, housekeepers and guards. The rest of the inhabitants are fishermen. Electricity is provided by Shams Alam resort.

The LRS project does not propose any physical interventions in Wadi El. The project will include Wadi El in its public outreach activities and enterprise development activities.

Abu Ghusun

Situated 80 km south of Marsa Alam, Abu Ghusun is inhabited by a relatively large population of about 1,600 persons, approximately 200 of whom are settlers from other parts of Egypt. The Phosphates Company and the civil service employ around 80% of the workforce, while the rest are involved in fishing or herding activities. Abu Ghusun has two co-educational schools, a primary school, and a preparatory school. It also has a youth center, a first aid center and a health unit. Most houses are provided by the state as part of a settlement program, in accordance with family needs and size. The Phosphates Company and the City Council supply electricity to the community. There is also a port at Abu Ghusun that belongs to the Phosphates Company.

The LRS project proposes providing partial funding for a headquarters building for Wadi Gemal National Park within the village of Abu Ghusun. In addition, the project will include Abu Ghusun in its public outreach activities and enterprise development activities.

Hamatah

Hamatah is home to 65 families (320 individuals) and lies 110 km to the south of Marsa Alam. The majority of the workforce is engaged in either herding or fishing, while about 20% are engaged in tourism-related activities. There are two schools – a primary and preparatory school – as well as a children's nursery and a first aid center. An electricity generator and a water distillation plant

supply the community with electricity and potable water. The Berenice Local Council premises are located in Hamatah.

The LRS project proposes physical interventions in Hamatah as part of a project-supported overall physical planning activity to improve the quality and quantity of housing and make the village a more attractive and functional tourism destination. The project's physical interventions will focus on housing construction. Given the project's extremely limited funds, the proposal calls for building a limited number of houses within the context of a larger plan. In addition, the project will include Hamatah in its public outreach activities, enterprise development activities and Environmental Awards Program

North of Wadi Gemal National Park

Marsa Alam

Marsa Alam is located 60 km north of the Wadi Gemal National Park, and 270 km south of Hurghada and 130 km south of Quseir. It is situated on the T-junction that connects Edfu (in the Nile Valley, 220 km west of Marsa Alam) to the Red Sea coast. Marsa Alam is a promising tourist destination because of its pristine beaches and marine ecosystems that are unique to the Red Sea, and because of the many ancient heritage sites located further south of the city. Scattered along the southern coast of Marsa Alam are numerous hotels and tourist resorts that are attracting a growing number of tourists, especially since the establishment of Marsa Alam airport, north of the city.

The total population of Marsa Alam is approximately 4,750. About 90% of the population is Ababda, while the rest are new settlers from the Nile Valley. The majority of the population is engaged in brokerage, mining, fishing, herding and trading. Positions in the civil services and tourist industry tend to be dominated by new settlers.

Marsa Alam has one functioning hospital, primary, preparatory and secondary schools for boys and girls, an Azhar school for boys and girls in their primary and secondary years, a social unit, a registry office, a health unit, a post office and a community development association (CDA). The CDA runs two nurseries, a social club, a women's club and a children's club. A distillation plant supplies the community with potable water. Electricity is also available. Marsa Alam is divided administratively into two local council units: Berenice and Sheikh Shazly. Transportation facilities between Marsa Alam and other cities, towns or communities are available in the form of minibuses and/or coaches except that there are no formal or regular transportation facilities to Sheikh Shazly, which is a matter of concern to the local communities. (Sheikh Shazly falls outside the scope of this study.

The LRS project does not propose any physical interventions in Marsa Alam. The project will include Marsa Alam in its public outreach and Environmental Awards Program. In addition, the project proposes purchase of equipment and the provision of technical assistance and training for a Material Recovery Facility (MRF), e.g. solid waste recycling facility, within the Marsa Alam municipal limits. The project will not undertake or fund any construction of facilities for the MRF. In addition the project will include Hamatah in its public outreach activities, enterprise development activities and Environmental Awards Program.

Awlad Baraka

The community of Awlad Baraka lies 14 km south of Marsa Alam. It is made up of 32 families (about 120 individuals) who rely mostly on fishing for a living. Because of their proximity to some tourist camps, about 40% of the inhabitants are employed in tourism- as cleaners, boat guides, or

sailors. Animal husbandry is practiced on a small scale, for family consumption purposes. The neighboring tourist camp supplies the community with electricity.

South of Wadi Gemal National Park

Shalateen

Shalateen is located 180 km to the south of the southern boundary of WGNP and 250 km to the south of Marsa Alam. The population of Shalateen is made up of people of the Ababda and Bisharin tribes as well as some Rashayda (who have migrated from the Sudan but whose ancestors were from the Arabian Peninsula) and some settlers from the Nile Valley. The majority of the Ababda and Bisharin are either herders or work as traders in Shalateen market. While some of the Ababda and Bisharin are involved in fishing, new settlers from the Nile Delta, especially those who have experience in fishing, dominate this activity. The total population of Shalateen is approximately 10,000.

Shalateen market is a hub of trade-related activity and the Camel market is a major tourist attraction. Most merchants are from Sudan, various governorates of Egypt or are from among the more prosperous local nomads. As part of its settlement plan for nomads in Shalateen, concrete houses have been provided by the state. So far, however, only a limited number of houses have been built, dispersed over the city. The majority of the population still lives in wooden shacks made of sheets of compressed wood, while some, particularly those living in the mountains further inland, are living in shacks made of timber.

Public amenities in Shalateen include electricity, a distillation plant providing water to the community and transportation in the form of privately owned minibuses. There are primary, preparatory and secondary schools in Shalateen as well as an Azhar Institute for all school levels. Social facilities are provided through the local CDA, which has a youth club, a children's club, a women's club and a senior citizen's club. An independent youth and sports club is also found in Shalateen. Shalateen council oversees five local units: Marsa Hemeira, Abrak, Ras Haderba, Abu Ramad and Halayeb. Only Marsa Hemeira falls within the geographic scope of the study.

The LRS project proposes to provide assistance that will help upgrade the existing camel market and commercial market of Shalateen. The USAID physical interventions will depend on the cost of the proposed interventions and the availability of funds; therefore at this point it has not yet been decided how much the project will assist in the physical upgrading of the market. Assistance might be limited to planning and technical assistance to the municipality and some limited physical interventions to improve infrastructure and public facilities.

Berenice

Berenice is situated on a highway 110km south of Marsa Alam. This ancient trading port (founded in approximately 257 BC) hosts some of the country's Roman treasures. Remains of the Semiramis Temple are situated near the modern town. About 170-180 families (approximately 900 individuals) make up the community of Berenice. The majority of the inhabitants (about 80%) are herders, while the rest of the population depends on fishing for a living. Berenice boasts a primary school and a preparatory school, a first aid center, a weaving center for girls and a military airport. A generator supplies the town with electricity. Several communities fall within the geographic scope of the Berenice Local Unit. These are listed below in order of proximity to Marsa Alam.

Ras Banas

The fishing community of Ras Banas is situated 180 km south of Marsa Alam, 50 km of which are off the paved road further along the coast. No facilities are available to its 60 families. The Hamatah Local Council transport water to Ras Banas. A generator is available, but it is out of order most of the time. In addition, there are other small settlements located in the deep mountain area as Sheikh Shazly, Sheikh Sidi Salem and Hafafeet.

Other Pressures of Wadi Gemal National Park and the surrounding areas

In addition to the municipalities and informal settlements located within the project area, there are a number of current and planned resort communities. These communities are developed by TDA and are called Integrated Development Corporations (IDCs). IDCs are essentially self-contained quasi-municipal entities that are privately-owned and that provide their own basic services, including electricity, water supply, sewerage, solid waste management and security. Guests visiting an IDC generally stay within its boundaries for the majority of their stay, using the IDCs hotels, golf courses, private beaches and other amenities. But some do venture out into the surrounding area to visit WGNP and other destinations in the region. Over time, the IDCs will place increasing pressure on the region's resources both in terms of increased visitation outside the IDC and increased resource use by the IDC itself. Table 1.1 shows current and planned IDC development in the Southern Red Sea region.

Table 1.1: Current and Planned IDCs in the Southern Red Sea

IDC Name	Location	No. Of Hotels		No. Of Rooms	
		Planned	Operating	Planned	Operating
Gabel El Gezeera El Hamra	70 Km North Marsa Alam	24	6	12,000	1,000
Marsa Shuni	50 Km North Marsa Alam	27	1	7,500	200
Marsa Murayn	43 Km North Marsa Alam	11	0	2,000	0
Marsa EL Nabi As-Saghir	30 Km North Marsa Alam	13	2	4,000	190
Marsa Shagraa	25 Km North Marsa Alam	29	10	6,000	2,030
Rasl Ad- Dirri	22 Km South Marsa Alam	30	1	7,700	50
Marsa Sharm AL Fqayrah	42 Km South Marsa Alam	11	1	8,400	160
Ras Hankurab	65 Km South Marsa Alam	14	0	4,400	0
Hamatah	105 Km South Marsa Alam	10	0	2,000	0
Lahami	120 Km South Marsa Alam	23	3	6700	270

1.3.2 Proposed Interventions

The LRS project has three sectoral components, all focused on supporting economic growth in the Red Sea Governorate. The project focuses primarily on technical assistance, training and procurement of equipment, with very limited funding for construction of facilities that support the project's core economic growth objective. Broadly, the project targets job creation, enterprise development and community development (Component A), promotion of sustainable tourism marketing and destination management (Component B) and conservation management of the natural resources of Wadi Gemal National Park (Component C).

All of the technical assistance, training, and equipment procurement has been categorically excluded from further consideration under USAID environmental procedures. Those activities that require construction of physical infrastructure are subject to review under USAID environmental procedures. Because the precise type and location of the physical infrastructure planned is not known at this time, the project proposed and USAID approved the completion of a PEA. The PEA will assess the types of physical interventions proposed and develop a set of engineering and facilities management best practices and environmental mitigation measures to eliminate or minimize any negative environmental impacts.

Component A focuses on creating short and long term employment opportunities for residents of the Southern Red Sea governorate. Short term job opportunities will come from employing residents in the construction of infrastructure related to solid waste management interventions, facilities in Wadi Gemal National Park and the upgrading of informal settlements in the region. Longer term employment will come from identifying economic growth and business development opportunities linked to the burgeoning tourism sector in the region. Component A will involve the construction of physical infrastructure for housing and other community development needs. The type of infrastructure proposed is listed in Table 1.1.

Component B activities focus on support for sustainable tourism, with activities targeted at key points in the value chain, and on promotion of sustainable tourism products to key markets. We will work to improve the institutional environment for sustainable tourism development, develop pilot activities/products in selected communities and create SME opportunities for local entrepreneurs. In addition, we will create long term linkages with sustainable tourism tour operators in key European markets. Component B will not involve the construction of any physical infrastructure.

Component C addresses the conservation management activities of the project. Effectively managing the natural and cultural resources that are the foundation for ecotourism development is a critical ingredient in the sustainable economic growth of the SRS. Component C will involve the construction of physical infrastructure in the form of basic facilities within Wadi Gemal National Park to support tourist visits. The type of infrastructure proposed is listed in Table 1.1.

Based on the LRS Life of Project Work Plan, a range of activities are planned that will require construction of facilities. These activities are shown in Table 1.1 below.

Table 1.2: LRS Proposed Infrastructure Activities

Infrastructure Category	Types of Planned Interventions	General Locations/Land Types
Basic facilities and park infrastructure	Outposts way-stations (community guards)	- Wadi Gemal

Infrastructure Category	Types of Planned Interventions	General Locations/Land Types
	Community guard posts	- Ras Baghdadi
	Park headquarters	- Abu Ghusun/Coastal
	Solar power generation (solar panels, inverters, chargers)	- Qula'an Bay - Sukiet - Wadi Gemal
	Pedestrian boardwalk (elevated)	- Qula'an Bay
	Nature trail	- Wadi Gemal Island - Sharm Luliyah - Qula'an Bay - Ras Baghdadi
	Vehicle access route demarcation	- Wadi El Gamal National Park - Qula'an Bay - Sharm Luliyah - Camel market in Shalateen
	Hiking trail demarcation	- Wadi Gamal National Park
	Car/ Bus park	- Wadi El Gamal NP/Coastal- - Qula'an Bay - Sharm Luliyah - Ras Baghdadi
	Camel yard	- Wadi El Gamal National Park - Ras Baghdadi
	Interpretive signs	- Wadi Gemal Island - Sharm Luliyah - Qula'an Bay - Sukiet
	Campground	- Wadi El Gamal NP/Sukiet - Sharm Luliyah west of the coastal road
	Installation of mooring buoys at dive sites	- Off-shore, Sharm Luliyah - Off-shore, Qula'an Bay - Off-shore, Wadi Gemal Island
	Planting palm trees/ shrubs	- Sharm Luliyah
	Rehabilitation of natural vegetation	- Ras Baghdadi
	Bird watching and observation platforms	- Wadi Gemal Island - Qula'an Bay - Ras Baghdadi
	Beach park facilities - Snack bar - Beach parasols - Park benches - Shaded areas	- Wadi Gemal Island - Sharm Luliyah - Qula'an Bay - Ras Baghdadi

Infrastructure Category	Types of Planned Interventions	General Locations/Land Types
	Community Self-Help Centers (gathering space, basic education schools, clinics, meeting room, small community services facilities)	- Qula'an Bay - Hamatah
Community Development	Public toilets at beaches	- Wadi Gemal Island - Sharm Luliyyah - Qula'an Bay
	Pit latrines or septic tanks at beaches	- Sharm Luliyyah - Qula'an Bay
	Fresh water tanks, standpipes, other small water interventions	- Sharm Luliyyah - Qula'an Bay
	Replacement or provision of small power generators	- Qula'an Bay
	Upgrading/restoration of fishermen houses or other small informal housing units	- Qula'an Bay
	Construction of Model houses for bedouins and fishermen and other local inhabitants	- Hamatah
	Upgrading local fishing boats for tourist use	- Sharm Luliyyah - Qula'an Bay
	Handicrafts and visitors Centers	- Shalateen
	Planning of camel and commercial market	- Shalateen
	Material Recovery Facilities and small solid waste dumps	- Shagra IDC, - Shams Alam/ Terrestrial - Hamatah - Shalateen

1.4 Administrative and Legal Framework

This section summarizes Egyptian environmental legislation, regulations and guidelines which are of direct or indirect relevance to the project. The proposed project falls under the administrative/legal jurisdiction of both USAID (the donor agency) and the Government of Egypt (the host country). The PEA for which this Scoping Statement has been prepared responds to the requirements of the USAID environmental procedures. A separate Environmental Impact Assessment (EIA) will be conducted to satisfy Egyptian legislative and regulatory requirements. The two assessments are discrete. However, much of the same baseline data, impact analysis and response mechanisms (e.g. engineering and management best practices and environmental

mitigation measures) will be used for both procedures. Because the PEA will be conducted prior to the EIA, it will in many ways lay the groundwork for the subsequent completion of the Egyptian EIA procedure.

The Egyptian legal and regulatory framework for environmental management is described briefly in the following subsection as background. It does not affect the conduct of the USAID PEA.

1.4.1 National Legal and Administrative Framework

Law 4/1994 (Law of the Environment).

Legislation Pertaining to the Egyptian EIA

According to Law 4/1994, Law of the Environment, and its Executive Regulations (ERs), the project proponent must prepare an Environmental Impact Assessment (EIA) for new projects and/or extension of existing facilities. According to the law, the EIA must be submitted to the Competent Administrative Authority (CAA) under whose jurisdiction the project falls. The CAA should assess the environmental impacts of the project and send the EIA to the Egyptian Environmental Affairs Agency (EEAA) to issue its response within 60 days. If no response is received by the end of this period, the study is automatically approved. The proponent is informed of the decision and, in the event of an approval, the required conditions for both construction and operation phases. The proponent has the right to issue an appeal within 30 days from the receipt of the decision.

According to the Egyptian Guidelines for EIA (EEAA, 1996), proposed developments are classified into three categories according to the severity of potential impacts. They reflect the increasing levels of environmental impact. The three categories are:

- **Category A:** projects with minor environmental impacts;
- **Category B:** projects with substantial impacts;
- **Category C:** projects with potentially high impacts.

Therefore, the CAA with assistance from EEAA should carry out a screening for each proposed project to identify the EIA category under which the project falls. This is usually carried out using the project lists prepared by EEAA. In case the project is not listed, EEAA has the right to assign the project to an appropriate level of assessment A, B, scoped or C

Environmental Regulations Pertaining to the Project

Set back lines

Law 4/94 for the environment prohibits the construction of any establishment within 200 meters of the Egyptian coast line unless there is permission to do so from the competent administrative authority in coordination with the EEAA. Executive Regulations of the Law add that building permits for any construction within the 200m zone also require the approval of the Shore Protection Authority (SPA), in coordination with the EEAA. The SPA Environmental Guidelines for Development in Coastal Areas, prepared by the EEAA, identify the coastal building front line as follows:

- In undeveloped land zones, i.e. virgin coastal stretches, the Coastal Building Front Line (CBFL) should be located not less than 200 m back from the highest high-tidal shoreline in accordance with Law 4/1994;
- In rocky or cliff-face shore fronts, a reduced set-back distance, i.e. less than 200 m, may be adopted on the condition that proper construction safety measures are fulfilled. A minimum distance must be set by inspection by the administrative authority in coordination with the Egyptian Environmental Affairs Agency.

Protection of Biodiversity

Article 28 of Law 4 of 1994 forbids hunting, shooting or catching the types of birds and wild animals specified in the Executive Regulations of the law. It also forbids the possession, transportation, carrying or selling of (or offering to sell) these birds and animals either dead or alive. The article also forbids damaging the nests or the eggs of these birds.

Article 23 of the Executive Regulations forbids causing harm to these birds and animals, as well as possessing or selling them either dead or alive, as prescribed in Annex 4 (of Law 4/1994). The provisions of this article shall apply in all natural reserve areas and also in areas where animals and birds are threatened with extinction, and for which a decree by the Minister of Agriculture or by Governors has been issued in coordination with the EEAA.

Article 24 of the Executive Regulations specifies that it is forbidden to issue permits for the hunting of wild birds and animals prescribed in Annex 4 (of Law 4/1994) of the ER except for scientific research purposes or for overcoming the spread of an epidemic or for other purposes approved by the EEAA.

Annex 4 (of Law 4/1994) identifies the above mentioned birds and wild animals as follows:

- Birds and animals stated on the list attached to decree of the Minister of Agriculture No. 28 of 1967, issued in implementation of the provisions of article 117 of Law No. 53 of 1966 promulgating the Law on Agriculture;
- Any other birds or animals to be determined by international conventions to which Egypt is a party;
- Any other birds or animals for which a decree shall be issued by the Minister of Agriculture with the agreement of the EEAA.

Environmental Register

Article 22 of Law 4/1994 and article 17 of its Executive Regulations stipulate that any project or establishments working in these areas should maintain an environmental register of their activities.

Law 102/1984 (Law of Natural Protectorates).

Law 102/1983 establishes the legal framework for the creation and management of protected areas in Egypt. According to this law, human activities are to be strictly controlled in the protected areas.

Any activities proposed within protected areas are subject to the approval of the CAA, in this case it is the Nature Protection Department (NPD) and the EEAA. Such approvals are also subject to EIA requirements. In this case, the EIA is submitted to the NPD for review and comments. Then, the EIA is sent to EIA Central Department, EEAA, to issue the final opinion. NPD has put conditions and rules for any developments within protected areas according to the nature, purpose and management plans of each. These should be observed while developing within the particular protected area.

1.4.2 USAID Environmental Procedures

The LIFE Red Sea project received a Positive Determination on September 15, 2005. Therefore USAID requires that an environmental assessment (EA) be prepared and approved before proceeding with any implementation of physical activities that may have a potential impact on the environment. This scoping statement is part of the EA development process.

According to section 216.6(c) of the USAID's environmental procedures (22 CFR 216), programs, projects or activities which are financed by USAID are required to submit an Environmental Assessment (EA). The Environmental Assessment is a detailed study of the reasonably foreseeable environmental impacts, both positive and negative, of a proposed USAID action and its reasonable alternatives. It includes alternatives which would avoid or minimize adverse effects or enhance the quality of the environment so that the expected benefits of development objectives can be weighed against any adverse impacts upon the human environment or any irreversible commitment of resources.

The typical approach to conducting an EA under the USAID environmental procedures is to assess the specific proposed interventions at the specific proposed locations for those interventions (along with reasonable alternatives to the proposed interventions and/or proposed locations). This approach is well-suited to a situation in which the proposed interventions and proposed locations are well-defined. However, in cases where the project objectives, along with political and institutional realities, require that the project has the flexibility to determine specific interventions and specific locations for these interventions on an ongoing basis, the typical EA approach is less effective.

In such cases, USAID has increasingly employed the PEA approach because a PEA allows for the assessment of a set of proposed interventions within a defined geographic area in which environmental baseline conditions are known and potential impacts can be accurately predicted. The interventions proposed by the LRS project meet the criteria for a PEA because a set or "basket" of possible interventions has been defined and the general locations have been determined. However, given the institutional challenges required to make final decisions regarding each specific intervention and each specific location (e.g. obtaining consensus among up to three GOE partners, plus a range of other stakeholders), it is not practical to conduct the required EA for either each intervention as it is finalized on a rolling basis or for all interventions after all have been finalized. Either of these alternatives would delay project implementation beyond the point of project viability.

The PEA approach provide the flexibility to conduct the EA work early in the project implementation cycle, while providing the same level of compliance with USAID environmental requirements, and more importantly, the same level of assurance that proposed interventions will be environmental sound. As described in Section 216.6(d), the PEA approach should, to the extent practicable, follow the same path as a traditional project EA, covering all the steps in the process that are necessary to describe baseline conditions, assess impact and make recommendations to mitigate any potential negative impacts. As such, the PEA will address all of the EA requirements

described in Section 216.6(c). The PEA is subject to USAID review and approval under the general procedures (22 CFR 216).

The PEA will result in a set of best practices for engineering and management of all constructed facilities, and a set of mitigation measures to address all potential negative environmental impacts of proposed interventions. In addition, the PEA will include an environmental monitoring plan that will be integrated with the LRS's existing project Monitoring and Evaluation Plan, to provide long term environmental monitoring of all project interventions. The "toolbox of best practices and mitigation measures will serve as a model for similar physical interventions on other sensitive lands in Egypt.

1.5. Environmental Setting

The project is geographically focused on the southern Red Sea (SRS). This region extends from the summits of the eastern desert mountains towards the Red Sea. The most appropriate and useful definition of an Environmental Planning Unit for the SRS is a watershed. Specifically, a watershed is defined as a major drainage basin comprised of one or more sub-basins that serve as a complete water catchments area. As mentioned earlier, the approximate scope of the project area includes the coastal area that extends from the Ras Toronbi (73 km north of Marsa Alam) to the Egyptian-Sudanese borders.

The Wadi Gemal-Hamatah Natural Protectorate is an environmentally and historically important area located in the SRS. The Protectorate is deemed important by the Egyptian government because of biological resources and marine ecosystems that are unique to the Eastern Desert and the Red Sea and because of the numerous heritage sites located within this area. Based on the diverse natural and heritage resources located within the Wadi Gemal- Hamatah region, the Government of Egypt formerly declared it as a Protectorate Area in January 2003.

A summary of the environmental setting of the project area is provided in the following sections to present an overview of the envelope within which the proposed interventions will be carried out. Interactions between proposed interventions and individual environmental components give rise to impacts, both positive and negative.

1.5.1. Accessibility

Access to the SRS is easy from two major transport centers. The city of Hurghada in the north currently offers international commercial air service and extensive marina facilities that enable easy and convenient access to this part of the Red Sea. The port facilities at Hurghada provide convenient marine access to the northern Red Sea Region. Tourists may travel by means of modern, high speed ferries, charter vessels, or live-aboard vessels.

Access to the SRS has been significantly improved by the recent completion of a major international airport and an enormous private marina facility. These facilities are located approximately 70 kilometers north of Marsa Alam. Marsa Alam International Airport is currently providing regular scheduled commercial services to Italy and Germany. The new marina facility in Port Ghalib is operational and has a mooring capacity for 1,800 vessels. If this capacity were to be fully realized, Port Ghalib would become one of the world's largest marinas. A visitor center was constructed near the new port facility and this will serve to promote visitation to sites throughout the southern zone of the Red Sea. All of these facilities have the potential of adding substantial numbers of tourists to the southern sector of the Red Sea region.

Several roads connect the SRS to the Delta and Valley including Marsa Alam-Edfu, El Qusier-Queft and Safaga-Qena. In addition, the Red Sea coastal road is connected to Suez and Cairo through junctions at El Ain El Sukhna.

1.5.2 Physical Features

1.5.2.1 Geology

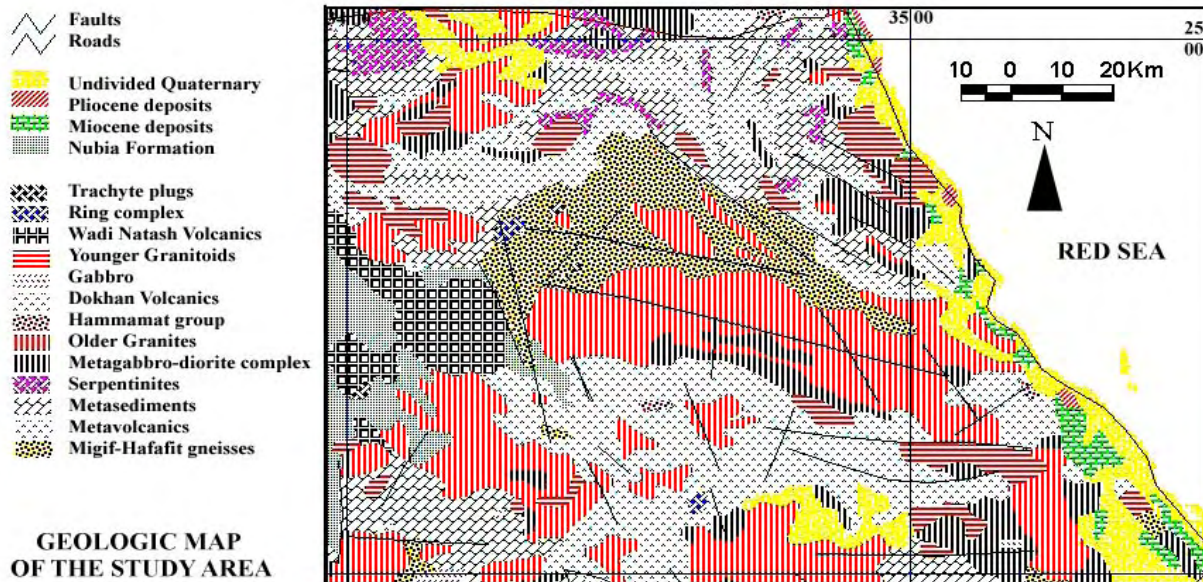


Figure 2: Geological and structural map of the area

The area under investigation is part of the Eastern Desert of Egypt, covered mainly by Pre-Cambrian igneous and metamorphic rocks with a thin blanket of Phanerozoic sedimentary rocks. Basement rocks are mainly Pre-cambrian, represented mainly by Hafafit gneisses, meta-volcano-sedimentary rocks, ophiolitic melang group, granitic rocks with some small outcrops of Hammamat sediments, and Dokhan volcanics. Dyke swarms, quartz veins and different types of veins are also present (Figure 1). More basement rocks have been intruded during the Cretaceous time, known as ring complexes.

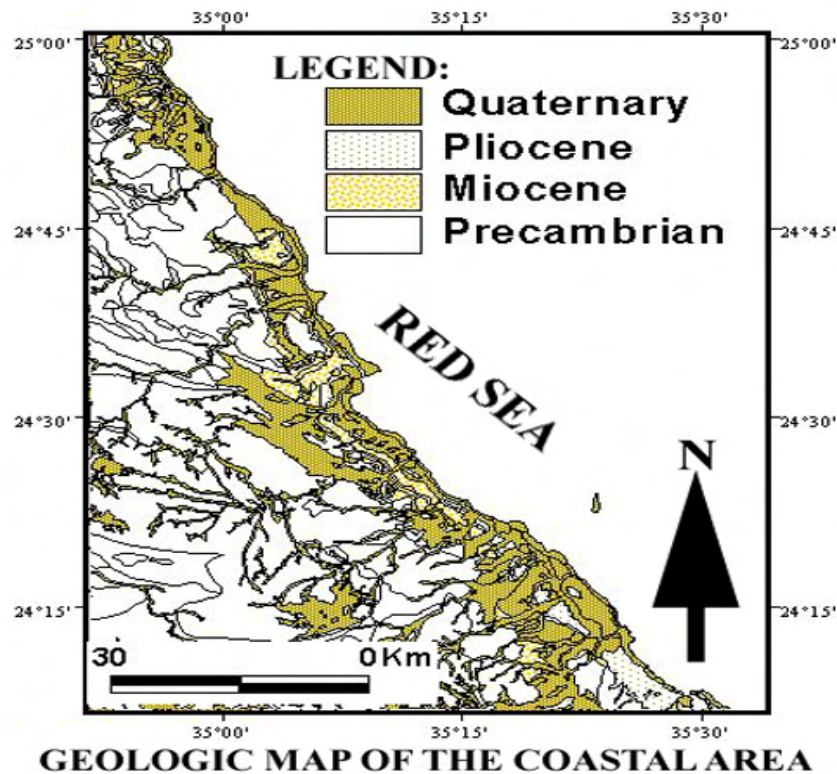


Figure 3: Basic geology of the project area

Along the Red Sea coastal plain the sedimentary rocks belonging to the Tertiary and Quaternary periods cover most of the basement complex. The Tertiary rocks consist of Paleocene chalk, Eocene limestone, Oligocene clastics, Miocene sediments, and Pliocene marine beds. The Quaternary deposits are represented by undivided Quaternary wadi deposits, sabkha and playa deposits (Figure 2).

Pre-Cambrian igneous and metamorphic rocks

These include the following rock units:

- Migif – Hafafit gneiss
- Metavolcano sedimentary rocks
- Ophiolitic mélange
- Granodiorite rocks
- Hammamat sediments
- Late-collision granites
- Dykes swarms
- Quartz Veins
- Phanerozoic rocks

and include the following:

- Miocene sediments
- Pliocene sediments
- Pleistocene sediments
- Quaternary Deposits

1.5.2.2 Geomorphology

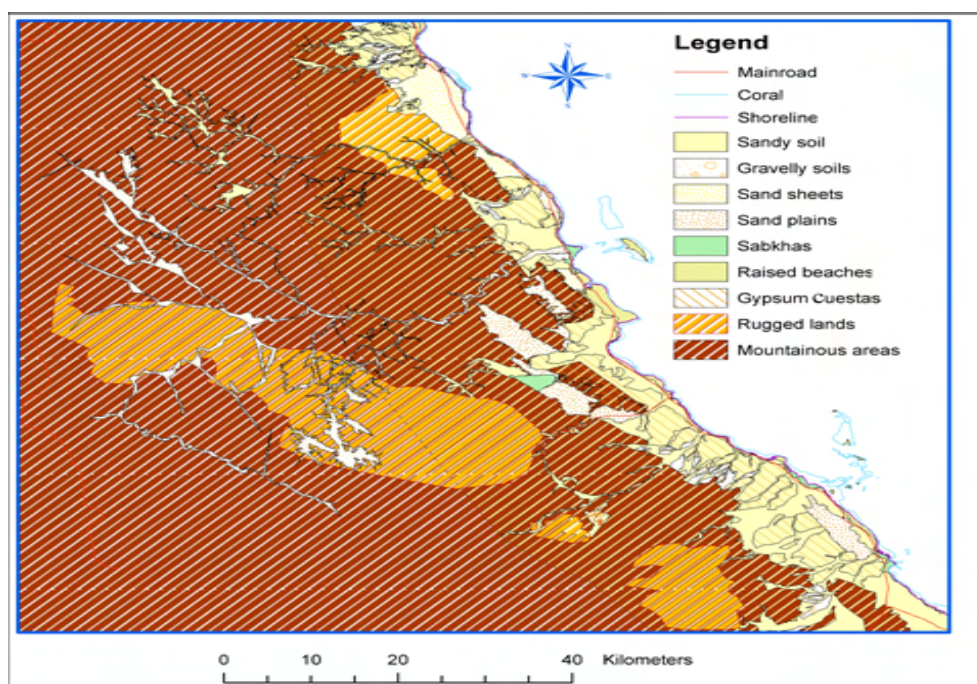


Figure 4: Geomorphological map of the area.

The area is rich with geomorphological features. Topographically, the area includes very high relief mountains such as Gabal Samak Mulak (1,976 meters a.s.l.), Gabal Hamatah (1,762 meters a.s.l.), Gabal El-Khashyyir (1,562 meters a.s.l.) and Gabal Abu Arqub (1,608 meters a.s.l.). All the high relief mountains are located in the southern part of the area while Gabal Nogrur (1,509 meters a.s.l.) lies in the northern part. Medium relief peaks are represented by Gabal Omul-Abas (690 meters a.s.l.), Gabal El-Mukhatatah (570 meters a.s.l.), Gabal Hafafit (879 meters a.s.l.). Eastwards, the relief becomes lower, passing into low hills, sedimentary cuestas, tablelands and plains.

Geomorphological units

The area is classified into nine geomorphologic units (Figure 3). Geomorphological units that can be discussed and mapped in the area are many. These geomorphological features are:

Mountainous areas in which the Red Sea Mountains represent the backbone of the whole territory.

Rugged lands: in which the granitic rocks reflect low separated hills with wide low areas in between.

Cuestas of sedimentary rocks: cuesta is a common expression of tilted sequence which varies in resistance to weathering according to its different lithology. It has an abrupt cuesta scarp in the up-dip side and a more gentle dip slope extending in the direction of the regional dip.

The terraces at the entrance of the wadis are formed of recent sediments, mainly of boulder of variable sizes. These terraces are suitable for any buildings in the back area away from flooding hazards.

Sand sheets are very wide, gently sloped, sand beaches like that opposite to Wadi Durri.

Sand plains are areas that are sand-covered at the back but not sandy directly along the beach, such as Aledindibat sand plain between Wadi Abu Ghusun and Wadi El-Jimal (Gemal)

Sand and gravel soils represent the soils at the entrance of the wadis and along the wadi floor. It may be gravelly, sandy or silty soil.

Sabkhas and salt marshes that are mostly along the coastal plane as a result of the salinity of sea water and nearness of evaporation in the area.

The raised beaches which bound the Red Sea and protect it from water wave erosion. They are formed mainly of old dead coral reefs. The beaches also show meandering, forming a set of bays, sharms and heads. Some islands formed mainly of reefal shoulder are present in the area.

Sand accumulation in Wadi Lolia, which is a very exciting phenomenon as it is formed in a narrow wadi representing the effects of the winds that have come from the southeast and lost their ability to carry sand as a result of hitting the mountains bordering this narrow valley.

1.5.2.3. Surface Hydrology

Drainage systems

The area has been cut by many major wadis of which Wadi El, Wadi Ghadeer, Wadi Omul Abas, Wadi Renga, Wadi Qalaan, Wadi Abu Ghusun and Wadi Lahmy are the most important. These wadis show very steep slopes in the area of the Red Sea mountains with no vegetation cover and the rocks are generally impermeable, causing heavy runoff of flooded water in the upstream areas. In the downstream area, the sedimentary rocks of reasonable permeability and the valleys are wide and flat causing the run-off to be reduced. Some measures against flooding have to be considered before any development of the area as the time of flood concentration seems to be short and the quantity of the flooded water that will hit any unsaved constructions are considerable. The alternatives for protection have to consider the importance of the flood water as a source of water for all fauna and flora and hence the measures have to be sited downstream. The drainage basins from these watersheds and their impacts in the area are presented in Figure 4).

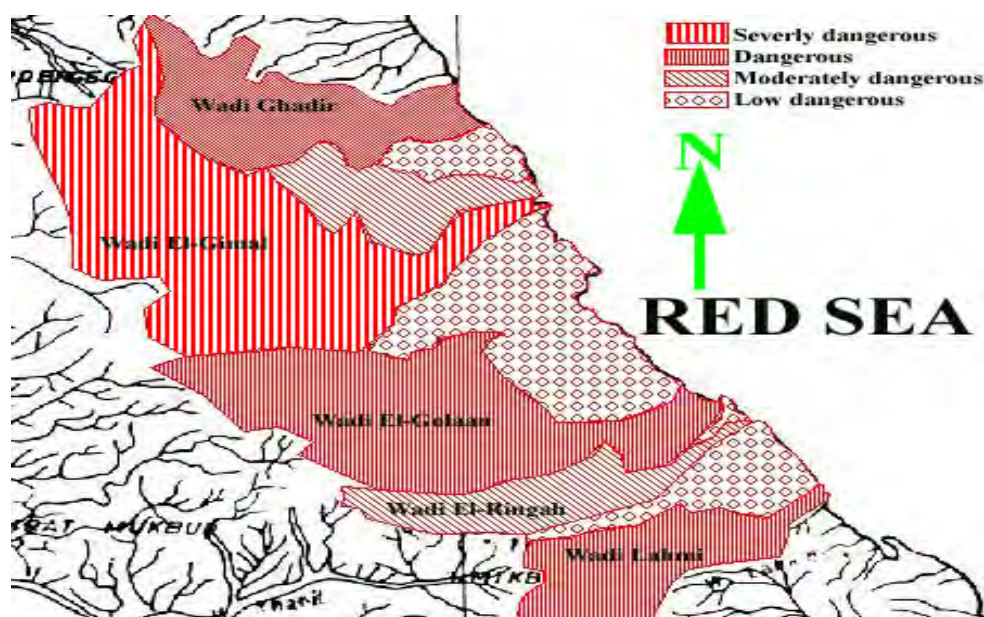


Figure 5: Watersheds (drainage basins)

1.5.3 Ecological Features

Four main ecological zones were identified for a typical watershed within the project area (Figure 5). These four zones are distinguished by the ways in which the biotic and abiotic components of the environment interact to generate landscape heterogeneity. A brief description of the four zones and their representative biodiversity is provided hereunder.

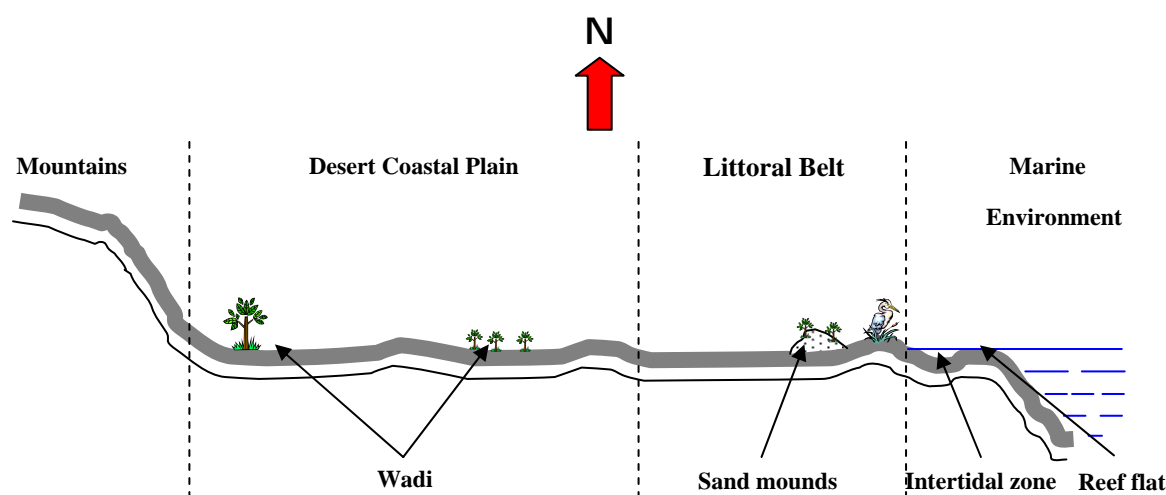


Figure 6: Schematic representation of the ecological zones of the study area

1.5.3.1 Zone 1: Mountains and Wadis

In the Eastern Desert, mountains of igneous or metamorphic rocks rise gradually from west to east. An extensive system of wadis dissects these mountains. Wadis flowing from the mountains to the Red Sea are relatively short, steep and more numerous compared with those draining westwards into the Nile Valley. Wadis may extend from the foothills to the coastal front or may not reach the coast. The downstream extremities of the main wadis may form deltaic basins. Superimposed on

this pattern, aeolian deposits may form sheets, mounds or hills of various size and extent. This complex set-up produces a likewise complex set up of habitat conditions. Within the desert plain ecosystem, the soil transporting agencies (water and wind) are actively operating.

The dominant vegetative species of the wadi is the Acacia tree. There are five species of Acacia trees found within the southern Red Sea Region and three of these species occur in the Study Area. The most common of these Acacia species is *Acacia tortilis* (Figure 6), followed by *A. raddiana*. Acacia trees are large, drought-resistant trees that play a vital role in the ecosystems of the wadis. They provide food and shade for several domestic and wild animals. Their wood is used by locals for construction and as a source of charcoal while the pods and bark are used for tanning and the flowers are used in the manufacture of cosmetics. Other common trees include *Balanites aegyptiaca* and *Tamarix aphylla* (Khedr, 2003).

Mountain dwelling animals include the very rare Nubian ibex, *Capra ibex nubiana* and the Rock Hyrax, *Procavia capensis*. The elusive Dorcas Gazelle (*Gazella dorcas*) is frequently seen running through the mountains in order to elude danger and migrate between wadis (Figure 7). All of these mammals are threatened and are now designated as protected species. The very rare Wild Ass (*Equus africanus*), also inhabits the Wadi Gemal – Hamatah Protectorate Area.



Figure 7: *Acacia tortilis* in Wadi Abu Ghosun

1.5.3.2 Zone 2: Coastal Plain

The coastal plain is non-saline as it lies above sea level and far from the reach of the tidal water. It is essentially a gravel-covered plain traversed by the main wadis and their tributaries.

Nine plant species were recorded by Khedr (2003) in the coastal desert plain. The dominant species are *Zilla spinosa*, *Zygophyllum coccineum* and *Tamarix aphylla* (Figure 8). The Wadi Gemal coastal area is a unique refuge for scarce botanical species. For example, the wadi delta has the only Dome Palm tree (*Hyphaene thebaica*) left on the shore of the entire Red Sea coast. Besides, a palm grove resembling an oasis is formed by the Date Palm *Phoenix dactylifera* (TDA/RSSTI, 2003; TDA,n.d.). Also, few medicinal plants are growing in this habitat such as *Anastatica heirochuntica* and *Cleome droserfolia*.



Figure 8: Fecal pellets of *Gazella Dorcas* on the floor of Wadi Ghadir

The coastal plain habitat is inhabited by a large number of reptilian species with lizards forming the largest group. Besides, different resident species of birds have been recorded at the Red Sea coastal plains, including several protected falcons such as *Falco concolor* (Figure 9), *F. biarmicus* and *F. pelegrinoides* (EEAA/UNEP, 1993; Basuouny, 2003).



Figure 9: *Tamarix aphylla* growing in a sandy habitat of the wadi bed

1.5.3.3 Zone 3: Littoral belt

The littoral belt comprises the coastal salt marshes and other associated habitat types as well as human settlements. The marshes comprise areas of land bordering the sea and are subject to periodic inundation by high tides. They have certain qualities related to the proximity of the sea that distinguish them from inland salt marshes (Chapman, 1974 and Zahran, 1977 in EEAA/UNEP, 1993).

Littoral salt marshes may be conceived as the seaward fringes of inland desert; their landward border is set by the desert conditions. Vegetation of the salt marsh ecosystem generally occurs in zones parallel to the shoreline.

Fifteen plant species were recorded in the study area, generally halophytes, sometimes mixed with xerophytes. The dominant species are *Arthrocnemum macrostachyum*, *Zygophyllum album*, *Tamarix nilotica* and *Limonium axillare*. Also, the rare halophytic species *Atriplex farinosa* and *Aeluropus massunesis* are recorded on the shores of the

study area (Khedr 2003) in the brackish water of Wadi Gemal delta (Figure 10). Also, the rare halophytic species *Atriplex farinosa* and *Aeluropus massunesis* are recorded on the shores of the study area.

A distinction may be noted between the salt marsh ground and the sand bodies overlying it. Salt marsh ground is usually formed by the accumulation of tidal mud or by land exposed by the subsidence of the sea. Sand mounds (Figure 11) are usually covered by *Zygophyllum album*; higher sandy hillocks by *Suaeda monoica* and *Nitraria retusa*.

Mangroves

Mangroves are found scattered along the Red Sea coast within the project area (Figure 12). Their usual habitat is shallow water in protected areas such as lagoons, bays, coral or sand bars parallel to the shore. Within the Red Sea coast, mangrove vegetation is usually dominated by *Avicennia marina* (EEAA/UNEP, 1993; GEF, 1997). *A. marina* is recorded as the dominant growth pattern in the study area at Ras Baghdadi, Al Qulaan and Wadi Lahmy.



Figure 10: The Sooty Falcon (*Falco concolor*)



Figure 11: Brackish water lagoon in Wadi El- dominated by *Ruppia maritima*, *Phragmites australis* and *Juncus rigidus*



Figure 12: *Tamarix nilotica* forming phytogenic mounds



Figure 13: Camels browsing on *Avicennia marina*

The coastal habitats support by far the largest bird population in the area, although the number of species is smaller in comparison to other habitats in the area (Basuouny, 2003). Most of these species are closely related to mangrove trees which provide suitable roosting, perching, nest building materials and feeding places. Cormorants, herons, falcons waders, gulls, terns, kingfishers and many migratory passerines are frequently seen at mangroves and reef areas. Characteristic species include the Striated Heron, *Ardeola gularis*, the Western Reef Heron *Egretta gularis* (Figure 13), the Spoonbill (Figure 14) *Platalea leucorodia*, the Osprey *Pandion haliaetus* and the Caspian Tern *Sterna caspia* that was found nesting on the mangrove trees in both Hamatah and Al-Qulaan as well as in Wadi El Gemal and Shwarit Islands.



Figure 14: Reef Heron
(*Egretta gularis*)



Figure 15: Common Spoonbill
(*Platalea leucorodia*)

1.5.3.4 Zone 4: Marine Environment

a) Fringing Reef

A large fringing reef extends along the coast of the southern Red Sea Region. From Marsa Alam to Sudan, the reef shelf is very wide extending in some places up to 500 meters with varying slopes. The reef generally protects the coastal area and experiences very little water movement, except when occasional swells from the west or north occur. The coral patches on this reef are 100 percent alive and with high species diversity. The number of coral species ranges from 23 to 35 species per site.

Although it is the “hard coral” framework which builds the reef foundation, there are many plants and animals which live in, on or among this framework. Coral reefs are considered most significant when considered as highly integrated ecosystems, including hard and soft corals, seaweeds, snails, slugs, crabs, shrimps, fishes, etc. The sea floor between Wadi Gemal Island and the shore consists of coarse sand interrupted in many areas with sea grass beds and coral patches.

Coral reefs of the Red Sea support approximately 400 fish species that utilize corals for shelter, food or as a breeding ground. Many of the reef fishes are of economic as well as recreational importance. 28 open water species are fished commercially from the area with groupers representing the most abundant species. Large snappers and pelagic species such as jacks and mackerel can also be expected to be found on the outer rim of the reefs.

b) Offshore Marine Environment

The offshore marine environment is a zone that begins at the most offshore perimeter of the fringing reef systems and extends seaward to the limit of Egypt’s jurisdiction. This zone constitutes another mosaic of endemic marine life within the coral patches and submerged reefs occurring between the shore and the islands. These submerged reefs present a hazard to any boat traffic circumnavigating the islands.

Based on marine surveys conducted by government agencies and scientific research organizations, the following fish species are known to inhabit the offshore marine waters in the vicinity of the Protectorate Area: Groupers (Serranidae), Snappers (Lutjanidae), Emperors (Lethrinidae),

Goatfish (Mullinidae), Wrasses (Labridae), Parrotfish (Scaridae), Surgeonfish (Acanthuridae), Rabbitfish (Siganidae), Damsels (Poracentridae), Angelfish (Pomocanthidae), Anthias (Anthiatidae), Butterfly (Chaetodonitidae) and Fusilier (Caesionidae).

c) Offshore islands

The study area encompasses 22 islands off the coast of the Egypt such as the Wadi Gemal Island. The mangrove stands on the islands, although small, are considered one of the most critical habitats throughout the coast. The presence of mangroves on this island makes it a perfect habitat for hundreds of island coastal birds, shorebirds and seabirds. Furthermore, diving activities should be carefully monitored to insure the minimum impact to the coral reef environment of the islands.

The Wadi Gemal Island is formed mainly of uplifted coral, about 5-10 meters above the sea level, and the western side has a long sandy beach. Mangrove trees grow in the southeastern corner of the island in a pocket of old reef. A large number of coral patches are located at the eastern side, while the western side faces a navigation channel and is rockier, with fringed coral. A large area of submerged reef is located slightly to the north of the island. The island supports globally significant bird species and it has been classified as an “Important Bird Area” by BirdLife International (Baha El Din, 1999).

In addition to the bird populations, two species of turtles, the Green Turtle (*Chelonia mydas*) and the Hawksbill Turtle (*Eretmochelys imbricata*) use the island as nesting grounds and dolphins are commonly seen swimming around the island. Almost all of the common species of reef fish are found along the entire reef areas around the island.

1.5.3.5 Summary of Critical Habitats

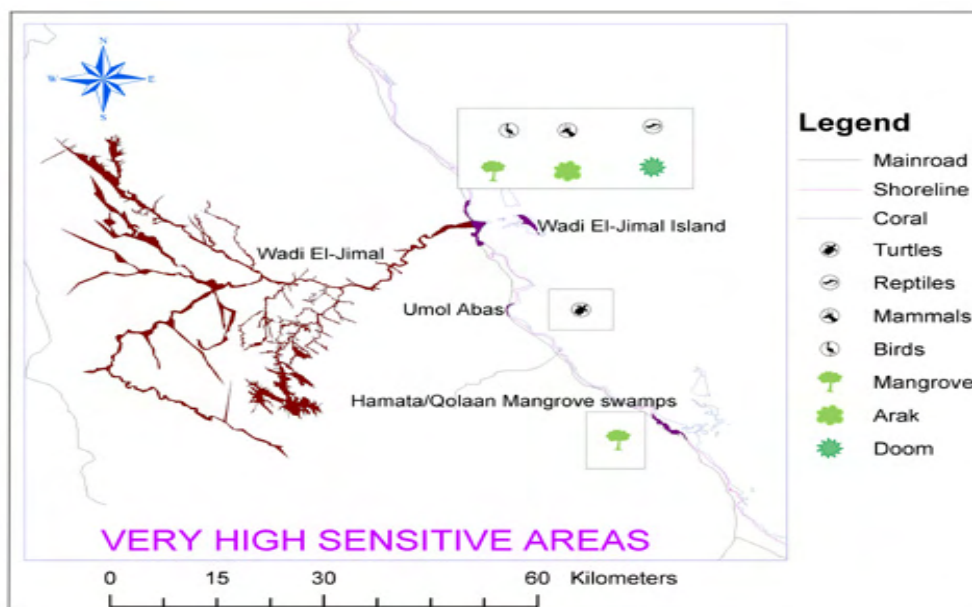


Figure 16: Area Sensitivities

The environmental quality and integrity of the SRS is perhaps best understood in terms of the ability of its plants and animals to thrive. The critical vegetative zones, mangroves, fringing reef systems, and critical bird nesting offshore islands are all sensitive habitats of higher concern. They support several locally and/or globally endangered species which are rapidly declining, mainly as a result of uncontrolled hunting and/or destruction of their natural habitat. The extent to which the SRS's environment can be sustained will depend upon the preservation of these critical habitats. Figure 15 shows the main sensitivities of the study area.

1.5.4 Socioeconomic Features

1.5.4.1. General Description of the Population of the Area

Even though the Eastern Desert seems desolate and uninhabitable, the area has been formed and maintained by human beings for millennia and is the homeland of indigenous populations with ethnic and cultural roots in this desert. In the Egyptian Southern Red Sea area, the population is composed of the following groups:

- a) Ababda
- b) Bisharin
- c) Rashayda
- d) Sedentarized Egyptians of the Nile Valley

The Beja people, to which the Ababda and the Bisharin tribes belong, are descendants of the Medja and the Blemmyes tribes that have been living in the Red Sea area for more than 4,000 years. Bejas are originally pastoral nomads that depend on animal husbandry. There are around 63,000 Beja people living in Egypt nowadays who are native Africans. They are called Ababda and Bisharin according to the kind of dialect they speak. The Rashayda is a pastoral group of Arabs that immigrated during the 19th century and settled in the Sudan, but are also found in the southernmost part of the Egyptian Eastern Desert.

The fifth population group is Nile Valley Egyptians who were originally farmers and traders and have only come to the Red Sea area during the last 50 years. The majority of them are from Upper Egypt. Very recently, a third emigration took place. It is linked to the tourist development of the area and consists mostly of Egyptians from the Nile Valley and Delta that came to work in the newly established hotels. They are generally single men, staying in the area for the duration of their work and frequently traveling back to their hometowns.

1.5.4.2. Traditional Land Use Patterns

a) Rangeland

The southern part of the Eastern Desert is rangeland where about 15,000 pastoralists live in the desert or on its margins. Their traditional system is essentially nomadic with seasonal movement of flocks in search of water and grazing. Their economy is characterized by seven key elements: sheep herding, goat-herding, camel-herding, charcoal production, collection of medicinal plants and temporal cultivation in ecologically favorable habitats, and fishing.

b) Mineral Resources

The southern Eastern Desert is well known for its wealth of mineral resources in metals and ornamental stones. At the present time, there are more than 200 mines in the larger southern Red Sea area, the majority extracting barites, quartz and feldspar. There are also several iron, almanite, phosphate, kaolin and talc mines. A total of about 600 quarries exist in the desert, extracting argil, sandstone, granite, marble, sand pebbles and clay. According to the 1993 Environmental Profile of Aswan, approximately 10,000 workers are employed in mines and quarries in the wider Eastern Desert.

c) Desert Tourism and Wildlife

The southern Red Sea area, with its fascinating landscape, interesting geological formations, rich wild life and numerous historical sites attracts naturalist, scientists, tourists and hunters.

d) Marine tourism and Fishing

The SRS region has an amazing diversity of marine tourist activities, including diving, snorkeling, marine sports and yachting. Also, fishing activities are available for recreational and industrial purposes on both a small or a wide scale.

1.5.4.3 Key Demographical Features of the Study Area

a) Population Distribution

The Aswan Boundaries District: It includes three districts: Marsa Alam District; Shalateen District; and Halayeeb District. The most important urban settlements are Marsa Alam City, Sheikh el Shazli Village, El-Thalatheen, Berenice Village, Abu Ghusun, Shalateen, Abu-Ramad, and Halayeb. The Aswan District extends for almost 460 Km and its inhabitants represent 10.63% of the Governorate's inhabitants according to 1996 statistics.

Table 1.3: Quantitative and Percentage Population Distribution-1996 statistics

Districts	Inhabitants	Percentage
Marsa Alam District	3,377	3.17
Shalateen District	9,947	6.39
Halayeb District	1,665	1.07
Red Sea Governorate	155,695	100%

The District of Marsa Alam is divided into three administrative units: Marsa Alam City Unit, Sheikh Shazli Village Unit and Berenice Village Unit. According to the 1996 population census of CAPMAS, the total number of inhabitants in 1996 was 3,377. The table below illustrates the population distribution according to the administrative units.

Table1.4: Population of Marsa Alam District-by District Units

	Marsa Alam City Unit			Berenice Village Unit			Sheikh Shazli Village Unit		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Number of inhabitants	928	718	1,646	572	448	1,020	366	350	716
Number below 6 years	139	119	258	82	105	187	31	33	64
Number between 6 and 15 years	181	189	370	132	101	233	37	52	89
Number between 15 and 65 years	585	401	986	343	239	582	285	253	538
Number above 65 years	23	9	32	15	3	18	13	12	25

In the Marsa Alam district 44.7% of the district population is female, 55.2% male and 45% of the district's population is below 20 years old. Only 4.6% of the population is older than 60 years. The average family size in the district is 3.94 persons per family. This is less than the average family size at Governorate level, which is 4.56 persons per family.

b) Education

The majority of the population is illiterate; very few can read and write. An insignificant percentage have a university degree, intermediate or vocational training. The illiteracy rate of Marsa Alam District is more than twice as high as the comparable rate of the Governorate, with 1,826 persons out of 3,382 being illiterate. The illiteracy rate of the female population in Marsa Alam District is 66%. This is twice the average for the female population of the Red Sea Governorate. The illiteracy rate of the male population of the District is 44.8%, nearly three times the average figure for the male Red Sea Governorate population. There are only eight primary schools in Marsa Alam, serving 1,116 students who represent 10.2% of the city's population. Marsa Alam has seven preparatory schools and three secondary schools serving 287 and 58 students respectively

The city of Shalateen has a primary and a secondary school, and a trade institute. Classroom density varies between 20 to 30 students per class. The primary and secondary school buildings in the city of Hamatah are in very poor condition and the general cleanliness both inside and outside the schools is very poor. Additionally, well-trained teachers and social workers, as well as female teachers, are sorely lacking. Sheikh Shazli has the highest illiteracy rate of the district; 85.4% of the population of the district cannot read and write.

c) Health services

Marsa Alam has one operating hospital, one family clinic and one ambulance. Shalateen has one general hospital which provides adequate health care service, but lacks equipment and specialized service providers. It also has two operating ambulances. Hamatah has one health unit which suffers from a severe shortage of medical equipment and professionals. The city council, however, in collaboration with the Ministry of Health, organizes immunization campaigns every three months for both urban and desert dwellers.

d) Economic Sectors

The main sources of income are animal husbandry (the most important), fishing, trade, crafts, tourism and labor. Almost all the population obtains its income through a primary and a secondary occupation, which includes security work, driving and working in coffee shops. The average household size is between five to seven members.

The most important sectoral employer in Marsa Alam City Unit is the Government, which employs 39% of the urban work force. In the rural areas of the district, the dominant sector is private businesses, which employs 39.7% of the active work force. At the Governorate level, 20.2% of the work force is employed by private enterprises. In Marsa Alam City Unit, 157 people out of 1,018 work in financial intermediation, real estate and business activities whilst 109 persons work in public administration or defense and 60 people work in educational establishments.

In the Sheikh Shazli Village Unit, 274 out of 563 people work in fishing, agriculture, hunting or logging whilst 18 work in public administration and eight people work in the mining sector. In the Berenice Village Unit, agriculture, hunting, forestry and fishing are equally important (as in Sheikh Shazli) and employ 187 people. The second most important sector is mining, which employs 111 people. Seven people are employed by the public administration. Male and female members of the society are found to be involved with varying degrees in various roles and responsibilities that can be grouped into three main categories, namely:

- **Reproductive role:** includes provision of food and water, preparation of shelter, planting and tending small home gardens.
- **Productive role:** includes animal herding, fishing, marketing, handicraft production, tailoring, and employment in the private and public sectors.

- **Community Management:** includes collective activities done for a larger group of society's members such as herding, membership in community organizations and fishing associations.

e) Water Sources

The majority of the population receives drinking water from the City Council's water distribution. City dwellers receive water directly in their houses where they get their water tanks filled. The water coming to their houses is distilled water from the sea and hence is too salty for consumption and often gets used for washing. Drinking water comes from Aswan, which is also the case in Abu Ghusun. To fill the tank, inhabitants have to pay between LE.10 in winter and LE.15 in summer. For those families whose main bread winner works in a mining company, the water is distributed by their employer for free. In other parts, like Wadi Lahmy, people obtain their drinking water from deep wells in the area.

The household consumption of a family with six members is estimated at one cubic meter every 7 days in summer and one cubic meter every 10 days in winter. This brings the individual consumption to 251 liters per day which is significantly below the minimum standard of WHO (701/d/c). Desert dwellers leave their empty water tanks on the main road where the city council comes to fill them for free. The only cost they have to pay is for the transportation of the water tanks. A car can charge between LE 30–50 to transport the water tanks to their shelters. In the summer, water consumption increases and thus their weekly water transportation costs also increase. Animals in both the desert as well as the villages are provided with their drinking water from the wells which are close by and have to be fetched by family members. The water is known to be unsuitable for human consumption because it is polluted and far too salty for human use. In severe cases, however, when there is no other water available, human beings resort to well water for drinking.

f) Basic Infrastructure

Table 1.5: basic Infrastructure in Villages

Service/Facility	Marsa Alam	Hamatah	Abu Ghusun	Awlad Baraka	Qula'an	Shalateen
Health Unit	√	√	√			√
Primary School	√	√	√			√
Secondary School	√		√			√
Electricity	√	From 9am to 2pm and from 7pm to 2am	√	√	√	√
Veterinary	√					√
Paved Road	√	Coastal Highway				√
Mobile Health Unit			√			
Sanitation Services	√					
Fresh Water	√					From desalination plant (not potable)
Market	√					√

Table 1.6: Other Infrastructure in Wadis

Location	Mobile Grocery	Water Truck	Bedouin Tent	Well	Grocery	School
Wadi El Nakari						
Wadi Abou Ghalka						
Wadi Gadir	√*					
Wadi Om Ghariga	√*					
Wadi Ambud						
Wadi/Gebel El Sukari		√**				
Wadi Lahmy			√	√		
Wadi Halfi					√	√
Wadi Rakhama						
Wadi Raghda						

*Twice a week/ ** distributes water to worker's shelter

g) Patterns of Mobility

The nomadic origin of people is clearly manifested in their high mobility. There are numerous reasons behind the constant move of the nomads. Rain, occupation and lately, school enrollment, are the most decisive ones.

Because they live far from civilization, they have to travel distances to obtain their goods, to receive health services or to apply for bureaucratic certificates from towns and cities such as Marsa Alam, Edfu, Qoseir and Aswan. They generally remain in the same wadi although from time to time may move to different locations. Surveys reveal that more than 80% of the population had a length of settlement that exceeded 10 years.

h) Problems and Needs

During the interviews with stakeholders, various problems were expressed which relate primarily to institutional concerns, e.g. lack of veterinary units, lack of funds for social clubs, lack of female extension staff, or economic concerns, e.g. marketing, work opportunities, etc., or to housing e.g. quality of house construction, electricity short cuts, and concerns regarding health. Needs expressed relate primarily to increase of economic opportunities, training courses and improvement of services and facilities.

2 Scoping Activities

Prior to the start up of scoping activities, several coordination meetings were held in the project's Cairo office in order to review the scope of work and carry out a preliminary "stakeholders" identification exercise. Based on these meetings key stakeholders were identified and a program for scoping activities was developed. This program included plans for individual meetings with concerned government agencies as well as focus-group discussions to which representatives from local government agencies were invited. Views and concerns of the local communities were sought during a field trip to the project area that was carried out between the 16th and 22nd of August 2005. During this field mission the general environmental settings of the sites where potential project interventions are suggested were explored and main features documented and photographed. During the mission all in-land focus sites have been visited and stakeholders met/interviewed. Meetings with TDA and the Central Department for Environmental Impact Assessment, Egyptian Environmental Affairs Agency (CDEIA/EEAA) were carried out in their offices in Cairo.

2.1 Stakeholder Identification

The initial identification of project stakeholders was based on an analysis of the institutional, legal and administrative framework of the project. Project review and experience of the team also assisted in the identification of the communities affected by the project and of local nongovernmental organizations (NGOs) with environmental interests in the project. The project stakeholders and their interests in the project is given in Table 2.1.

Table 2.1: Stakeholders and their Relevant Role/Interest in the Project

Stakeholders	Role/ Interest
Egyptian Environmental Affairs Agency (EEAA): <ul style="list-style-type: none">- EIA Department- Nature Protection Department- Regional Branch Office, Red Sea	Overall coordinating body for regulating, monitoring, and enforcement of developments through setting the EIA system, managing the protection and preservation of natural environment and coordination with concerned and responsible authorities. Information sources.
Tourism Development Authority (TDA)	Managing the land owned by the TDA, and ensuring the execution of environmentally sound tourism developments.
Red Sea Governorate	Legal/administrative role on the local level, local planning, development and environmental role.
Environmental Management Unit, Governorate	Environmental arm of the governorate.
Heads of Red Sea City Councils	Represent the views of the government and communities on the local level.
NGOs and representatives of the public (city/local council members)	Represent the views of the community and their needs, safeguard the environment and influence decision making, carry out community development activities.
Local residents (nomads, fishermen, employers, mine workers, women, etc)	Main beneficiaries of the project and may be affected by its activities.
Scientific community	Research in related topics and influence decision making

	through public channels. Information sources.
Safari Operators	Knowledge of the project area and potential user of local workforce.
Tourist hotels	Knowledge of the project area and experience with local community, and potential user of local workforce

The stakeholder identification process outlined above was among the first tasks of the scoping process. Understanding the potential interests of these groups not only assisted in the stakeholder identification process, but also assisted in determining the structure and content of the meetings to be held. Understanding the views, interests and knowledge base of the local communities is also very important for determining the specific interventions and specific locations for those interventions, thus maximizing the project's positive benefit to the community.

2.2 Scoping Meeting Process

In each scoping meeting, the PEA team made a brief presentation about the project, tailoring each presentation to the individual stakeholder group with whom they were meeting while covering the same basic information with each group to assure consistency. The PEA team also described the PEA process and the proposed project interventions.

3 Significant Issues To Be Addressed in the PEA

The PEA team used a basic decision support system to identify the significant issues that will be addressed in the PEA. The decision support system consists of two sequential phases. In Phase 1, the team compiled the general issues expressed by stakeholders during scoping meetings and judged their significance. In Phase 2, the team recast those general issues into more specific and actionable environmental issues. Aligning those issues with each of the general types of interventions planned by the LRS project. The decision support system relies on four sequential tables that advance the process from the raw data obtained from the stakeholders to a final set of significant environmental *issues* linked to potential environmental *impacts* and aligned with each type of planned physical intervention.

3.1 Issues Identified by Stakeholders

In Phase 1 of the decision support system, the PEA team screened stakeholder issues to determine their significance in the context of the planned LRS physical interventions. The data resulting from the scoping meetings varied by group. In some cases these issues expressed were very broad, encompassing several specific environmental issues. In other cases, the issues expressed were not environmental in nature. Regardless of their relevance, however, the PEA team included all of the issued expressed by stakeholders in the initial phase of the analysis. After compiling the stakeholder issues, the PEA team The recasting process was guided by the experience of the PEA team in assessing the environmental issues associated with similar infrastructure projects. This analysis is captured in Tables 2.2 and 2.3.

- Table 2.2: Summary of Stakeholder Issues. This table captures the all of the general issues, environmental and non-environmental, identified by stakeholders during the various stakeholder meetings and interviews conducted by the team. This table also contains other pertinent information related to each issue identified by stakeholders.
- Table 2.3: Screening of Stakeholder Issues to Determine Significant Environmental Issues. This table provides analysis of each of the stakeholder issues captured in Table 1.7 to determine whether they are *significant*. Significance is judged using two criteria: (1) whether the activities proposed by the LRS project might reasonably have any impact on the issue (e.g. assessing relevance to the proposed interventions); and (2) the potential magnitude of any potential environmental impacts related to each specific issue. This process is subjective but based on the experience of the PEA team assessing environmental impacts of the same or similar activities. Table 1.8 also screens out issues deemed *not significant*, using the same two criteria. The analysis began with determining a clear definition of the issue itself. In some cases this process has meant recasting the issue in terms that distill it to a core environmental issue. The team identified the range of likely negative environmental impacts that could reasonably result from that core issue and determined the relevance of the issue to the LRS project and to the project's proposed interventions.

Table 2.2 : Summary of Stakeholder Issues

Issue	Summary of Issue	Issue Location(s)	Stakeholder Who Raised Issue
Solid waste dumping at sea	Dive boats and fishermen routinely dump their solid waste at sea, primarily because it is expeditious. However, there is some anecdotal evidence that providing a better system for collection and improving enforcement would encourage them to dispose of their waste on shore at designated points.	Various, along Southern Red Sea coast	Park Rangers
Disposal of animal carcasses	The large camel market in Shalateen generates a high volume of animal carcasses. These carcasses are dumped in a large, uncontrolled dump site which is a breeding ground for disease and other environmental problems, and a very serious impediment to increased tourist visitation to the area.	Shalateen	Shalateen municipal officials
Disposal of discarded vehicle chemicals (e.g. motor oil)	Visitors to WGNP and the park rangers themselves drive vehicles into the Park. They should not, and in fact are not likely to, conduct vehicle maintenance, including replacement of vehicle chemicals, within the Park, expect possibly on an emergency basis.	WGNP	Park Rangers
Use of imported building materials and architectural styles	The Bedouin tribes in the Southern Red Sea region have long traditions regarding the building styles and building materials they use for their homes and other community structures. The materials and styles now dominant in the commercial (e.g. resort) sector in the region do not match local styles. It is important to honor the needs and traditions of the local people when designing and building housing and other community structures for their use.	Hamatah Shalateen Abu Ghusun	RSG officials

Issue	Summary of Issue	Issue Location(s)	Stakeholder Who Raised Issue
Cutting of acacia trees for construction	There is extremely limited availability of wood for construction in the Southern Red Sea region. Acacia trees are the dominant tree species in this harsh physical environment. Increased population pressure over the past 10-20 years has led to a precipitous reduction in the number of acacia trees remaining. The local people understand the value of these trees for shade, animal fodder and other sustainable uses and they rely on them as such. It is critical that no building proposed by the project use acacia trees as construction material.	Throughout Southern Red Sea, particular in the vicinity of Shalateen and Hamatah	RSG officials Local people in Shalateen
Hiking and driving off demarcated trails	Because of the lack of control of entry and exit points, and the limited internal management of movement in WGNP, visitors have been able to drive around the park more or less at will, without staying in designated areas. This situation has begun to improve as the park rangers have increased their management oversight, but it remains an issue to be assessed in the context of the project's actions to demarcate existing vehicle and hiking trails.	Throughout WGNP	Park Rangers
Improper sewage and solid waste disposal in undesignated areas	As tourist visitation increased in WGNP's sensitive areas, there is an increased risk of serious damage to the Park's extremely fragile ecosystems if proper systems are not put into place to protect these natural assets from environmental damage.	Areas throughout WGNP, particularly Wadi El Gemal Island	Park Rangers

Issue	Summary of Issue	Issue Location(s)	Stakeholder Who Raised Issue
Introduction of alien plants and animal species	The dominant resort development paradigm in the Southern Red Sea region is to landscape with imported plant species that resort owners believe tourist expect (e.g. tropic plants). These plants species are not adapted to the extremely harsh desert climate and require tremendous amounts of fresh water to stay alive. In addition, certain alien plant species that can survive in the Southern Red Sea environment can “escape” into the wild and compete with native species. The importation of animal species likewise puts an increased burden on the region’s extremely scarce water and other natural resources.	Throughout Southern Red Sea region	Park Rangers
Inappropriate and inadequate settlement conditions for local people	Given the limited attention that the region has received from the central government, housing and other basic infrastructure is generally very poor. While the government has encouraged historically nomadic tribes to settle, it has not provided the resources to make this transition smooth. The project must take into account the needs of local communities when developing its interventions regarding community development.	Hamatah Shalateen	RSG officials

Issue	Summary of Issue	Issue Location(s)	Stakeholder Who Raised Issue
Resource conflicts between tourism users and local communities	As tourist visitation continues to increase in the Southern Red Sea region, there will be increasing competition for the region's extremely scarce natural resources. It is therefore critical that tools to avoid conflicts wherever possible are developed, that unavoidable resource conflicts are managed so that local communities are not unfairly denied access and that to the extent possible local communities receive direct benefits from the use of the region's resources by tourists.	Throughout the Southern Red Sea region	RSG Officials Various local community residents
Consideration of Red Sea Governorate policy and plans	It is important that the project's plans are consistent with and developed in coordination with local RSG officials and working level staff to assure that these activities are in line with the immediate and long term plans of the Governorate, thus avoiding conflicts with the RSG and avoiding the creation of unrealistic expectations on the part of local communities.	NA	RSG officials and staff
Coordination with Nature Protection Department/EEAA	All of the activities proposed by the project for implementation within the boundaries of WGNP must be closely coordinated with the RS Protectorate staff to assure that that are consistent with immediate and long term plans for the Park's development and management.	NA	RS Protectorate and EEAA officials and staff
Local community participation	Given the historical marginalization and lack of consideration of local community needs, it is critical that all planning for community development and much of the development within WGNP include local community representation in all phases.	Throughout the Southern Red Sea region	Representatives of local communities

Table 2.3 : Screening of Stakeholder Issues to Determine Significant Environmental Issues

Issue	Potential Negative Environmental Impact(s)	Relevance to LRS Project	Types of Planned Interventions	General Locations	Significance of Issue (Y/N)
Issue Expressed: Solid waste dumping at sea Core Issue: Improper Solid Waste Management	1. Damage to coral reefs and other marine ecosystems 2. Disease from waste washing up on beaches 3. Degradation of aesthetic appeal of tourist assets 4. Noxious odors	Project proposes support to partners who plan to construct facilities to support Community Development (e.g. HEPCA, RSG)	Technical assistance, training and equipment procurement for Material Recovery Facilities	(a) Shagra IDC (b) Shams Alam/ WGNP (c) Hamatah (d) Shalateen	Significant Proposed project activities in the area of SWM almost certainly will have positive environmental impact. Although the project does not propose construction of SWM facilities, its substantial involvement with the establishment of these facilities by its partners argues for the assessment of these activities by the PEA
Issue Expressed: Improper disposal of animal carcasses Core Issue: Improper solid Waste Management	1. Human and/or animal infection from disease vectors (e.g. flies) attracted to decaying carcasses 2. Contamination of groundwater 3. Degradation of aesthetic appeal of tourist assets 4. Noxious odors	Project proposes support to partners who plan to construct facilities to support Community Development (RSG)	Technical assistance and training toward the establishment of a formal waste disposal facility	Shalateen	Significant Proposed project activities in the area of SWM almost certainly will have positive environmental impact. Although the project does not propose construction of SWM facilities, its substantial involvement with the establishment of these facilities by its partners argues for the assessment of these activities by the PEA
Expressed Issue: Improper disposal of discarded vehicle chemicals (e.g. motor oil) Core Issue: Same	1. Contamination of groundwater 2. Degradation of aesthetic appeal of tourist assets	Project proposes no interventions that will directly or indirectly increase dumping of vehicle chemicals in the project area	NA	NA	Significant Project interventions likely will not create significantly increased vehicular traffic in and around WGNP. However, it is a good idea to consider this issue in the PEA in light of future growth in Park visitation.

Issue	Potential Negative Environmental Impact(s)	Relevance to LRS Project	Types of Planned Interventions	General Locations	Significance of Issue (Y/N)
Expressed Issue: Use of imported building materials and architectural styles Core Issue: Same	1. Increase in solid waste burden on fragile ecosystems 2. Degradation of aesthetic appeal of tourist assets 3. Diminution of local traditional building practices	Project proposes construction of facilities to support (a) WGNP basic facilities and park infrastructure; and (b) Community Development	(a) WGNP basic facilities and park infrastructure (i) community guard posts; park headquarters; (ii) beach park facilities (snack bars, shaded areas) (b) Community Development (i) community self-help centers (gathering space, basic education schools, clinics, meeting room, small community services facilities); (ii) public toilets at beaches (iii) pit latrines and septic tanks at beaches; (iv) upgrading and restoration of fishermen houses or other small informal housing units; (v) construction of model houses for Bedouins and fishermen and other local inhabitants	(a) WGNP basic facilities and park infrastructure (i) Community guards posts – undetermined locations within WGNP (ii) Park Headquarters – Abu Ghusun (iii) Beach Park Facilities – Qula'an, Sharm Luliyyah (b) Community Development (i) Community Self-Help Centers – Qula'an, Hamatah (ii) public toilets at beaches – Wadi Gemal Island, Sharm Luliyyah, Qula'an (iii) pit latrines and septic tanks at beaches – Sharm Luliyyah, Qula'an (iv) upgrading and restoration of fishermen houses or other small informal housing units – Qula'an (v) construction of model houses for Bedouins and fishermen and other local inhabitants – Hamatah	Significant

Issue	Potential Negative Environmental Impact(s)	Relevance to LRS Project	Types of Planned Interventions	General Locations	Significance of Issue (Y/N)
<p>Issue Expressed: Cutting of acacia trees for construction</p> <p>Core Issue: Tree Cutting for construction of facilities</p>	<p>1. Destruction of wildlife habitat</p> <p>2. Increased soil erosion/ sedimentation degrading coral/coastal vegetation</p> <p>3. Degradation of aesthetic appeal of tourist assets</p>	<p>Project proposes construction of facilities to support (a) WGNP basic facilities and park infrastructure; and (b) Community Development</p>	<p>(a) WGNP basic facilities and park infrastructure</p> <p>(i) community guard posts; park headquarters; (ii) beach park facilities (snack bars, shaded areas)</p> <p>(b) Community Development</p> <p>(i) community self-help centers (gathering space, basic education schools, clinics, meeting room, small community services facilities); (ii) public toilets at beaches</p> <p>(iii) pit latrines and septic tanks at beaches; (iv) upgrading and restoration of fishermen houses or other small informal housing units; (v) construction of model houses for Bedouins and fishermen and other local inhabitants</p>	<p>(a) WGNP basic facilities and park infrastructure</p> <p>(i) Community guards posts – undetermined locations within WGNP</p> <p>(ii) Park Headquarters – Abu Ghusun</p> <p>(iii) Beach Park Facilities – Qula'an, Sharm Luliyyah</p> <p>(b) Community Development</p> <p>(i) Community Self-Help Centers – Qula'an, Hamatah</p> <p>(ii) public toilets at beaches – Wadi Gemal Island, Sharm Luliyyah, Qula'an</p> <p>(iii) pit latrines and septic tanks at beaches – Sharm Luliyyah, Qula'an</p> <p>(iv) upgrading and restoration of fishermen houses or other small informal housing units – Qula'an</p> <p>(v) construction of model houses for Bedouins and fishermen and other local inhabitants – Hamatah</p>	Significant
<p>Issue Expressed: Hiking and driving off demarcated trails</p> <p>Core Issue: Unmanaged travel/movement in WGNP</p>	<p>1. Destruction of vegetation</p> <p>2. Increased soil erosion/ sedimentation</p> <p>3. Degradation of wildlife habitats</p> <p>4. Degradation of aesthetic appeal of tourist assets</p>	<p>Project is actively supporting efforts to control and regular access to and within WGNP is protect the Parks flora and fauna</p>	<p>(a) Pedestrian boardwalk (elevated)</p> <p>(b) Nature trail</p> <p>(c) Vehicle access route demarcation</p> <p>(d) Hiking trail demarcation</p>	<p>(a) Pedestrian boardwalk (elevated) – Qula'an</p> <p>(b) Nature trail – Wadi Gemal Island, Sharm Luliyyah, Qula'an, Ras Baghdadi</p> <p>(c) Vehicle access route demarcation – WGNP, Qula'an, Sharm Luliyyah, El Shalateen</p> <p>(d) Hiking trail demarcation -- WGNP</p>	Significant

Issue	Potential Negative Environmental Impact(s)	Relevance to LRS Project	Types of Planned Interventions	General Locations	Significance of Issue (Y/N)
Expressed Issue: Improper sewage and solid waste disposal in undesignated areas Core Issue: Same	1. Human and/or animal infection from disease vectors (e.g. flies) 2. Contamination of groundwater 3. Degradation of wildlife habitats 4. Contamination of marine ecosystem/coral reefs by nutrient loading 5. Degradation of aesthetic appeal of tourist assets	Project proposes construction of facilities to support (a) WGNP basic facilities and park infrastructure; and (b) Community Development	(a) WGNP basic facilities and park infrastructure (i) public toilets at beaches (b) Community Development (i) pit latrines and septic tanks at beaches (ii) technical assistance, training and equipment procurement (no construction of facilities) for Material Recovery Facilities	(a) WGNP basic facilities and park infrastructure (i) public toilets at beaches – Wadi El Gemal Island (b) Community Development (i) pit latrines and septic tanks at beaches – Qula'an, Sharm Luliyyah (ii) technical assistance, training and equipment procurement (no construction of facilities) for Material Recovery Facilities – Shagra IDC, Shams Alam/ WGNP, Hamatah, Shalateen	<i>Significant</i>

Issue	Potential Negative Environmental Impact(s)	Relevance to LRS Project	Types of Planned Interventions	General Locations	Significance of Issue (Y/N)
<p>Expressed Issue: Introduction of alien plants and animal species</p> <p>Core Issue: Same</p>	1. Degradation of native plant and animal species	Project proposes construction of facilities to support (a) WGNP basic facilities and park infrastructure; and (b) Community Development	<p>(a) WGNP basic facilities and park infrastructure</p> <p>(i) community guard posts; park headquarters; (ii) beach park facilities (snack bars, shaded areas)</p> <p>(b) Community Development</p> <p>(i) community self-help centers (gathering space, basic education schools, clinics, meeting room, small community services facilities); (ii) public toilets at beaches</p> <p>(iii) pit latrines and septic tanks at beaches; (iv) Upgrading and restoration of fishermen houses or other small informal housing units; (v) construction of model houses for Bedouins and fishermen and other local inhabitants</p>	<p>(a) WGNP basic facilities and park infrastructure</p> <p>(i) Community guards posts – undetermined locations within WGNP</p> <p>(ii) Park Headquarters – Abu Ghusun</p> <p>(iii) Beach Park Facilities – Qula'an, Sharm Luliyyah</p> <p>(b) Community Development</p> <p>(i) Community Self-Help Centers – Qula'an, Hamatah</p> <p>(ii) public toilets at beaches – Wadi Gemal Island, Sharm Luliyyah, Qula'an</p> <p>(iii) pit latrines and septic tanks at beaches – Sharm Luliyyah, Qula'an</p> <p>(iv) upgrading and restoration of fishermen houses or other small informal housing units – Qula'an</p> <p>(v) construction of model houses for Bedouins and fishermen and other local inhabitants – Hamatah</p>	<p>Significant</p> <p>To the extent that any facilities constructed by the project include any landscaping, the issue of using local plant species and minimizing the use of non-native species, particularly invasive species will be assessed during the PEA</p>

Issue	Potential Negative Environmental Impact(s)	Relevance to LRS Project	Types of Planned Interventions	General Locations	Significance of Issue (Y/N)
Expressed Issue: Inappropriate and inadequate settlement conditions for local people Core Issue: Same	1. Destruction of traditional practices 2. Human and/or animal infection from disease vectors (e.g. flies) 3. Contamination of groundwater 4. Degradation of wildlife habitats 5. Contamination of marine ecosystem 6. Degradation of aesthetic appeal of tourist assets	Project proposes construction of facilities to support Community Development	Community Development (i) community self-help centers (gathering space, basic education schools, clinics, meeting room, small community services facilities); (ii) public toilets at beaches (iii) pit latrines and septic tanks at beaches; (iv) upgrading and restoration of fishermen houses or other small informal housing units; (v) construction of model houses for Bedouins and fishermen and other local inhabitants	Community guards posts – undetermined locations within WGNP (ii) Park Headquarters – Abu Ghusun (iii) Beach Park Facilities – Qula'an, Sharm Luliyah (b) Community Development (i) Community Self-Help Centers – Qula'an, Hamatah (ii) public toilets at beaches – Wadi Gemal Island, Sharm Luliyah, Qula'an (iii) pit latrines and septic tanks at beaches – Sharm Luliyah, Qula'an (iv) upgrading and restoration of fishermen houses or other small informal housing units – Qula'an (v) construction of model houses for Bedouins and fishermen and other local inhabitants – Hamatah	Significant Proposed project activities are intended to improve housing conditions in targeted local communities. However, it is important that local needs and traditional practices are integrated into the process throughout.

Issue	Potential Negative Environmental Impact(s)	Relevance to LRS Project	Types of Planned Interventions	General Locations	Significance of Issue (Y/N)
Expressed Issue: Resource conflicts between tourism users and local communities Core Issue: Same	1. Diminution of traditional practices 2. Degradation of aesthetic appeal of tourist assets	Project proposes construction of facilities to support (a) WGNP basic facilities and park infrastructure; and (b) Community Development	(a) WGNP basic facilities and park infrastructure (i) community guard posts; park headquarters; (ii) beach park facilities (snack bars, shaded areas) (b) Community Development (i) community self-help centers (gathering space, basic education schools, clinics, meeting room, small community services facilities); (ii) public toilets at beaches (iii) pit latrines and septic tanks at beaches; (iv) Upgrading and restoration of fishermen houses or other small informal housing units; (v) Construction of Model houses for Bedouins and fishermen and other local inhabitants; (vi) technical assistance, training and equipment procurement (no construction of facilities) for Material Recovery Facilities	Community guards posts – undetermined locations within WGNP (ii) Park Headquarters – Abu Ghusun (iii) Beach Park Facilities – Qula'an, Sharm Luliyah (b) Community Development (i) Community Self-Help Centers – Qula'an, Hamatah (ii) public toilets at beaches – Wadi Gemal Island, Sharm Luliyah, Qula'an (iii) pit latrines and septic tanks at beaches – Sharm Luliyah, Qula'an (iv) upgrading and restoration of fishermen houses or other small informal housing units – Qula'an (v) construction of model houses for Bedouins and fishermen and other local inhabitants – Hamatah; ; (vi) technical assistance, training and equipment procurement (no construction of facilities) for Material Recovery Facilities – Shagra IDC, Shams Alam/ WGNP, Hamatah, Shalateen	Significant Although the project is using a participatory and inclusive approach to development of facilities and activities, it is important that the issue of resource conflict is assessed in the PEA
Expressed Issue: Lack of consideration of Red Sea Governorate policy and plans Core Issue: Same	No specific impacts	Project is working in close coordination with the RSG on all relevant activities to assure that all activities are designed and implemented consistent with RSG policies and plans	NA	NA	Not Significant While there are no specific environmental issues associated with the issue raised, it is important that the project assess the process by which proposed activities are designed and implemented to assure complete coordination with the RSG

Issue	Potential Negative Environmental Impact(s)	Relevance to LRS Project	Types of Planned Interventions	General Locations	Significance of Issue (Y/N)
Expressed Issue: Lack of coordination with Nature Protection Department/EEAA Core Issue: Same	No specific impacts	Project is working is close coordination with the Red Sea Protectorate staff and with the EEAA managers in Cairo on all relevant activities to assure that all activities are designed and implemented consistent with Red Sea Protectorate and EEAA policies and plans	NA	NA	<i>Not Significant</i> While there are no specific environmental issues associated with the issue raised, it is important that the Project assess the process by which proposed activities are designed and implemented to assure complete coordination with the Red Sea Protectorate and EEAA
Expressed Issue: Lack of local community participation Core Issue: Same	No specific impacts	Project planning approach is to involve local communities residents in its activities throughout the design and implementation process	NA	NA	<i>Significant</i> While there are no specific environmental issues associated with the issue raised, it is important that the PEA assess the process by which proposed activities are designed and implemented to assure that local community residents are involved throughout

3.2 Significant Issues

In Phase 2 of the decision support system, the PEA team recast the general environmental issues judged significant in Phase 1 into a set of more specific environmental issues aligned to each type of planned LRS physical intervention. The team then determined the potential environmental impacts and predicted effects of those impacts for each of the environmental issues. The resultant is a final set of issues and potential impacts for study during the PEA. This analysis is captured in Tables 2.4 and 2.5.

- **Table 2.4: Interventions and Significant Environmental Issues.** This table takes the issues and analysis from Phase 1, presenting a set of significant environmental issues aligned to each type of planned intervention.
- **Table 2.5: Significant Environmental Issues and Potential Environmental Impacts and Effects.** This table relates each of the significant environmental issues from Table 2.4 to potential environmental impacts in both the construction and operations phases of the planned interventions. Table 2.5 also includes predicted effects from those environmental impacts.

Table 2.4: Interventions and Significant Environmental Issues

Types of Planned Interventions	General Locations	Significant Environmental Issues
Outposts way-stations (community guards)	Wadi Gemal National Park	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Soil Erosion • Air Quality • Noise Level • Solid Waste Disposal • Viewscape • Worker Health and Safety
Community guard posts	Ras Baghdadi	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Soil Erosion • Air Quality • Noise Level • Solid Waste Disposal • Viewscape • Worker Health and Safety
Park headquarters	Abu Ghusun/Coastal	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Marine Ecosystem/Coral Reefs • Soil Erosion • Air Quality • Noise Level • Solid Waste Disposal • Viewscape • Worker Health and Safety
Solar power generation (solar panels, inverters, chargers)	Qula'an Bay Sukiet Wadi Gemal	<ul style="list-style-type: none"> • Native Vegetation • Terrestrial Wildlife Habitat • Viewscape • Bedouin Traditional Cultural Practices • Worker Health and Safety

Types of Planned Interventions	General Locations	Significant Environmental Issues
Pedestrian boardwalk (elevated)	Qula'an Bay	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Marine Ecosystem/Coral Reefs • Solid Waste Disposal • Viewscape
Nature trail	Wadi Gemal Island Sharm Luliyyah Qula'an Bay Ras Baghdadi	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Soil Erosion • Solid Waste Disposal • Viewscape
Vehicle access route demarcation	Wadi Gamal National Park Qula'an Bay Sharm Luliyyah Camel market in Shalateen	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Soil Erosion • Air Quality • Noise Level • Solid Waste Disposal • Viewscape • Worker Health and Safety
Hiking trail demarcation	Wadi Gamal National Park	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Soil Erosion • Solid Waste Disposal • Viewscape
Car/ Bus park	Wadi Gamal National Park/Coastal Qula'an Bay Sharm Luliyyah Ras Baghdadi	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Soil Erosion • Air Quality • Noise Level • Solid Waste Disposal • Viewscape • Worker Health and Safety
Camel yard	Wadi Gamal National Park Ras Baghdadi	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Marine Ecosystem/Coral Reefs • Soil Erosion • Surface Water Quality (marine) • Solid Waste Disposal • Viewscape • Public Health and Safety
Interpretive signs	Wadi Gemal Island Sharm Luliyyah Qula'an Bay Sukiet	<ul style="list-style-type: none"> • Viewscape
Campground	Wadi Gamal National Park/Desert Sharm Luliyyah west of the coastal road	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Soil Erosion • Solid Waste Disposal • Viewscape • Bedouin Traditional Cultural Practices
Installation of mooring buoys at dive sites	Off-shore, Sharm Luliyyah Off-shore, Qula'an Bay Off-shore, Wadi Gemal Island	<ul style="list-style-type: none"> • Marine Ecosystem/Coral Reefs
Planting palm trees/ shrubs	Sharm Luliyyah	<ul style="list-style-type: none"> • Marine Ecosystem/Coral Reefs • Soil Erosion

Types of Planned Interventions	General Locations	Significant Environmental Issues
Rehabilitation of natural vegetation	Ras Baghdadi	<ul style="list-style-type: none"> • Marine Ecosystem/Coral Reefs • Soil Erosion
Bird watching and observation platforms	Wadi Gemal Island Qula'an Bay Ras Baghdadi	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Marine Ecosystem/Coral Reefs • Solid Waste Disposal • Viewscape
Beach park facilities - Snack bar - Beach parasols - Park benches - Shaded areas	Wadi Gemal Island Sharm Luliyyah Qula'an Bay Ras Baghdadi	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Marine Ecosystem/Coral Reefs • Solid Waste Disposal • Viewscape
Community Self-Help Centers (gathering space, basic education schools, clinics, meeting room, small community services facilities)	Qula'an Bay Hamatah	<ul style="list-style-type: none"> • Native Flora • Terrestrial Fauna • Solid Waste Disposal • Viewscape • Bedouin Traditional Cultural Practices
Public toilets at beaches	Wadi Gemal Island Sharm Luliyyah Qula'an Bay	<ul style="list-style-type: none"> • Marine Ecosystem/Coral Reefs • Soil Quality • Water Supply • Viewscape • Public Health and Safety
Pit latrines or septic tanks at beaches	Sharm Luliyyah Qula'an Bay	<ul style="list-style-type: none"> • Marine Ecosystem/Coral Reefs • Soil Quality • Viewscape • Public Health and Safety
Fresh water tanks, standpipes, other small water interventions	Sharm Luliyyah Qula'an Bay	<ul style="list-style-type: none"> • Water Supply • Public Health and Safety
Replacement or provision of small power generators	Qula'an Bay	<ul style="list-style-type: none"> • Air Quality • Viewscape • Worker Health and Safety • Public Health and Safety
Upgrading/restoration of fishermen houses or other small informal housing units	Qula'an Bay	<ul style="list-style-type: none"> • Soil Erosion • Air Quality • Noise Level • Solid Waste Disposal • Viewscape • Worker Health and Safety
Construction of Model houses for Bedouin and fishermen and other local inhabitants	Hamatah	<ul style="list-style-type: none"> • Soil Erosion • Air Quality • Noise Level • Solid Waste Disposal • Viewscape • Bedouin Traditional Cultural Practices • Worker Health and Safety • Resettlement
Upgrading local fishing boats for tourist use	Sharm Luliyyah Qula'an Bay	<ul style="list-style-type: none"> • Marine Ecosystem/Coral Reefs • Solid Waste Disposal • Worker Health and Safety • Public Health and Safety

Types of Planned Interventions	General Locations	Significant Environmental Issues
Handicrafts and Visitors Centers	Shalateen	<ul style="list-style-type: none"> • Soil Erosion • Air Quality • Noise Level • Solid Waste Disposal • Viewscape • Bedouin Traditional Cultural Practices • Worker Health and Safety
Planning of camel market	Shalateen	<ul style="list-style-type: none"> • Soil Erosion • Air Quality • Noise Level • Solid Waste Disposal • Viewscape • Bedouin Traditional Cultural Practices • Worker Health and Safety • Public Health and Safety
Material Recovery Facilities and small solid waste dumps	Shagra IDC, Shams Alam/ Terrestrial Hamatah Shalateen	<ul style="list-style-type: none"> • Soil Erosion • Air Quality • Noise Level • Solid Waste Disposal • Viewscape • Bedouin Traditional Cultural Practices • Worker Health and Safety • Public Health and Safety

Table 2.5 : Significant Environmental Issues and Potential Environmental Impacts and Effects

Issue Category	Significant Issue	Project Phase		Potential Impact	Predicted Effect
		Construction	Operation		
Biological	Native Flora	✓	✓	Destruction of vegetation	1. Loss of wildlife habitat 2. Loss of native flora 3. Diminution of aesthetic/scenic quality of resources
Biological	Terrestrial Fauna	✓	✓	Stress on native wildlife	1. Decrease in sightings and/or numbers of native animals of specific species 2. Diminution of aesthetic/scenic quality of resources
Biological	Marine Ecosystem/Coral Reefs	✓	✓	Damage to coral reefs	1. Loss of marine habitat 2. Increased coastal erosion 3. Diminution of aesthetic/scenic quality of resources
Physical and Chemical	Surface Water Quality (marine)	✓		1. Increased turbidity 2. Chemical contamination 3. Biological contamination/eutrophication	1. Loss of marine habitat (coral reefs) 2. Diminution of aesthetic/scenic quality of resources
Physical and Chemical	Groundwater		✓	1. Chemical contamination 2. Biological contamination	Loss of potable water supply
Physical and Chemical	Water Supply		✓	Increased use of potable water	Shortage of potable water
Physical and Chemical	Soil Quality		✓	Soil contamination	Loss of native flora
Physical and Chemical	Soil Quantity	✓	✓	Soil erosion and sedimentation	1. Blocking of roadways 2. Undercutting of roadways, bridges, culverts
Physical and Chemical	Air Quality	✓		Increased airborne particulates	Increased respiratory illness
Physical and Chemical	Noise Level	✓		Increased noise levels	Interference with local community activities
Physical and Chemical	Odor Level		✓	Noxious Odors	1. Interference with local community activities 2. Diminution of aesthetic/scenic quality of resources
Physical and Chemical	Solid Waste Management	✓	✓	1. Soil contamination 2. Soil erosion and sedimentation 3. Increased airborne particulates 4. Increased noise levels 5. Noxious Odors	1. Loss of native flora 2. Blocking of roadways 3. Undercutting of roadways, bridges, culverts Increased respiratory illness 4. Interference with local community activities 5. Diminution of aesthetic/scenic quality of resources
Physical and Chemical	Viewscape		✓	Views obstructed	Diminution of aesthetic/scenic quality of resources
Social and Cultural	Worker Health and Safety	✓	✓	Unhealthy and/or unsafe working conditions	Injury from workplace accidents

Issue Category	Significant Issue	Project Phase		Potential Impact	Predicted Effect
		Construction	Operation		
Social and Cultural	Public Health and Safety	✓	✓	Unhealthy and/or unsafe living conditions and/or facility operating conditions	Increased injury and/or illness
Social and Cultural	Bedouin Traditional Cultural Practices		✓	Destruction and/or interference with traditional cultural practices	Loss of cultural identity
Social and Cultural	Resettlement		✓	1. Destruction and/or interference with traditional cultural practices 2. Interference with social and/or economic livelihoods	1. Loss of cultural identity 2. Increased poverty

3.3 Issues Eliminated from Further Consideration

Several general issues raised by stakeholders during scoping meetings have been deemed *not significant* because they do not have any specific environmental impacts associated with them. These include:

- Lack of consideration of Red Sea Governorate policy and plans
- Lack of coordination with Nature Protection Department/EEAA

Environmental issues that might potentially flow from these concerns will be addressed during the course of the PEA. In addition, the PEA team strongly suggests that the LRS project team work hand-in-glove with officials from its three GOE partner agencies in the implementation of all project activities.

All other issues identified by project stakeholders have been deemed significant and will be assessed during the PEA.

4 Schedule for Preparing the PEA

The PEA team intends to produce the draft PEA report by 31 January 2006. This date likely will be in advance of the approval of the PEA Scoping Statement. However, given that the PEA approach already was officially approached by USAID, that much of the baseline data needed for the PEA report has already been collected and that under the PEA methodology specific interventions and specific sites (and alternatives to those interventions and sites) will not be assessed, the PEA team is confident that any modifications to the Scoping Statement necessitated by USAID review will not impact the PEA report approach. The PEA team proposes the following phased schedule:

Phase 1: Baseline data collection	Days 1-3
Phase 2: Impact Assessment	Days 4-10
Phase 3: Mitigation Measures Development	Days 11-14
Phase 4: Environmental Monitoring Plan Development	Days 15-18
Phase 5: PEA Report Writing	Days 19-25

5 Proposed Approach to Address Significant Issues

The analysis completed in this Scoping Statement provides the framework that will guide the work on the PEA team in the completion of the PEA. Using this framework and conducting the PEA pursuant to the process described in USAID's environmental procedures, the team will determine which potential environmental impacts might be significant. Significant environmental impacts will be subject to further analysis after consideration of alternative mitigation measures, while insignificant impacts will not be considered further. Mitigation measures will be either incorporated as an integral part of the design (e.g. best engineering practices) or through environmental management best practices. A monitoring plan will be formulated to ensure that project performance is meeting the set standards and that the mitigation measures are working to achieve the desired level of impact minimization. The Environmental Management Plan will:

- Track implementation of the mitigation measures
- Monitor environmental performance with respect to all project interventions
- Implement recommended training activities to support the mitigation measures

Consistent with the PEA objectives the mitigation measures identified will serve as a “toolbox” from which the LIFE Sea project team and its GOE partners may draw in order to address any and all potentially significant environmental issues resulting from project interventions. In this way, the PEA also will serve as a model for other projects and other implementing organizations undertaking physical interventions on sensitive lands elsewhere in Egypt.

The PEA team will be comprised of the following disciplines:

- Team Leader/Environmental Impact Assessment Specialist (with specific expertise in the conduct of environmental assessment pursuant to USAID Environmental Procedures)
- Urban and Environmental Planner
- Marine Biologist
- Terrestrial Biologist
- Civil Engineer
- Social and Cultural Issues Specialist

Each PEA team member will assist in the analysis of issues relevant to his/her discipline, with the team leader managing the analysis within the context of the PEA objectives.

References

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Annex 1

Scoping Meetings

This annex contains summaries of the scoping meetings conducted by the PEA team as part of the scoping process. As discussed in the main scoping statement, the PEA team undertook an approach to the scoping process that included a number of small, focused scoping meetings with different sets of stakeholders. This approach, which was officially approved by USAID, was deemed more appropriate than the typical large scoping meeting that often serves as the centerpiece of the USAID scoping process. The reasons for using the selected approach, which were also explained in the main report, included:

- The project geographic area is relatively large and sparsely inhabited. It therefore was not practical to bring together important stakeholders in one location, particularly nomadic Bedouins whose input to the scoping process was critical
- Organizing a meeting that brings together all the necessary GOE representatives is extremely difficult, given their conflicting schedules and their different locations (i.e. EEAA and TDA based in Cairo, RSG based in Hurghada)
- Many of the key stakeholders, particularly the Bedouins, would likely not attend a formal scoping session with high government officials present. And to the extent any of them would have attended, they very likely would not have felt comfortable expressing freely their opinions.

Using this approach allowed the team to target their presentation of the project and their questions to the specific group with whom they were meeting. The team worked with the LRS project staff and representatives of each of the project's three GOE partners to assure that they identified and met with all relevant project stakeholders. The PEA team is completely satisfied with the results of this process, having had enthusiastic and thoughtful discussion and comments from stakeholders during their various meetings.

Egyptian Environmental Affairs Agency (EEAA)

Meetings with EEAA officials aimed at informing them about the project as well as soliciting information about any special requirements that would be needed for EIA. Their views of the ecological sensitivity of the project area, relevant baseline information and any potential impacts due to the proposed interventions were also sought.

a. EIA Central Department

A meeting was held on November 10th 2005 in the Central Department of the EIA in the EEAA headquarters in Cairo. Mr. Mohamed Farouk, Director of the Red Sea Coast Department, represented the department in this meeting. After explaining the nature of the proposed interventions and their geographic extent, Mr. Farouk indicated that according to the new administrative procedures, any development within the 200 m setback line, whatever its size or nature, is subject to approval from the Shore Protection Authority (SPA). Mr. Farouk also drew attention to the possibility that on the national level the project EIA may have to deal with several Competent Administrative Authorities including the TDA, Red Sea Governorate and Nature Protection Department, according to the jurisdiction over land.

He also indicated that due to the early stage of this proposal (program level) it is hard for EEAA to contribute any significant information as they currently deal with EIA on the project level (which necessitates details on the exact sites, layouts, capacities, etc). Accordingly, it was agreed that another consultation will be arranged with him as the proposal advances.

b. Natural Protectorate Department

During the field visit to the project area (August 2005), several meetings were held with representatives of the department. Interviews were conducted with the senior management on the local level as well as with field staff, i.e. rangers. Discussions focused on main environmental and ecological sensitivities of the region, specific sensitivities of each focus site of the project, anticipated impacts and sources of information. The information related to each focus site is given under each relevant site while the general concerns or issues identified during our meetings are described here below:

- Any work inside the National Park or within its perimeter should be coordinated with the department to ensure consistency and avoid replication of efforts.
- The integrity of the whole ecosystem of Wadi Gemal Park should be taken into consideration in the planning of any activities.
- Integrating the local community in development plans is an important concern.
- Impact of increasing maritime activities through project interventions on deliberate solid waste dumping should be addressed.
- Solid waste management of tourist resorts and at Shalateen markets is among the main concerns.
- Support of the rangers' efforts in patrolling marine and desert segments of the Park is of paramount importance for enforcement. Coordination with the Park staff is required for any interventions related to this need.
- Protection of important ecosystems (marine/land) and adoption of best practices during construction and operation of proposed facilities should be coordinated with the Park staff as they have good experience and knowledge of the area.
- Lack of specific trails results in many environmental impacts therefore there is a pressing need for such trails on the mainland and on islands.
- Sufficient information is available on Wadi Gemal Island and many studies have been carried out on its diverse biota. This information should be consulted when

developing detailed plans for the island.

- Any development in the desert part of the project area should protect natural vegetation and medicinal plants and should integrate historic sites present deep in the wadis as new attractions.
- Impacts of toilets and/or pit latrines on coastal and marine ecosystems should be addressed.

c. Red Sea Governorate (RSG)

A joint meeting in the RSG with General Mahmoud El Gindy, former Secretary General of RSG and project coordinator and Dr. Nabil Amin, Head of the Environmental Management Department/Unit (EMU) was held on October 25th 2005. The following issues and concerns were identified and discussed during the meeting:

- It is the policy of the governorate to build focus settlements to be able to provide services. Qula'an is not one of such focus settlements, so the people currently living there will be re-settled. Accordingly, the project should not plan for providing them any settling services there.
- Any settlement planning or re-planning activities in the project area should be based on the desert nature of the region, should use local building material and should not replicate any unsuitable "urban" type plans.
- The local people should participate in the choice of the type and services provided for them through any future development. Local people's views and ideas are the key factor and not those of the local council's members as the latter may have hidden agendas.
- Any planning in Shalateen should take existing plans of the governorate into consideration.
- Local people suffer some cultural problems as they have not fully adapted to living close to tourists.
- Shalateen suffers from solid waste problems and the lack of sanitary landfill for dead animals.
- There is another serious problem in Shalateen which is related to containers of hazardous material (filled or empty). This represents a separate big business in this city and it poses a dangerous health and environmental problem that passes unnoticed.
- Environmental sensitivities include coral reef ecosystems, mangroves and flash flood plains.

d. Tourism Development Authority (TDA)

A meeting took place in the TDA headquarters in Cairo with Dr. Mohamed Hassanien, Environmental Central Department, on October 19 2005. After listening to an explanation of the purpose of the meeting and the objectives of the project and its interventions, Dr. Hassanien made the following remarks:

- The proposed interventions appear to be limited in their impacts and any anticipated impacts would be insignificant.
- The new role of Shore Protection Authority in coastal development should be taken into consideration while preparing EIAs.
- All project interventions within the TDA's land should be coordinated with them so they are carried out within the already present frameworks.
- In case infrastructure interventions are proposed, the Planning and Infrastructure Departments of the TDA should be consulted.

Scoping activities in the project focus areas

Marsa Alam

A focus group meeting was held in the premises of Marsa Alam City Council. This meeting was attended by several people who represent education, social, information and administrative/political aspects of the City (a full list of attendees is given in Annex 1).

Issues identified by the attendees included the following:

- Solid waste and health services are among the most important environmental problems.
- Coral reefs and marine environment are the most valuable resources.
- Mining is a potential economic activity, while fishing is retreating.
- All developments should be located to the west of the coastal road to allow for future expansion, for example extension of roads.
- Environmental concerns are best identified by the personnel of Nature Protection Department.
- Any future developments should provide some direct benefits for the local community.
- Any plans in Hamatah should be developed according to land use plans already developed for this area.
- The majority of NGOs work in the field of community development with little or no emphasis on environment.
- World Food Program is currently working in the area to provide food for work by digging wells and assisting in settling nomads around those wells to grow vegetation for their herds as well as some vegetables for their use. This program may be a new stakeholder of the project.
- Desert Research Institute/Ministry of Agriculture has also been identified as a potential stakeholder, specially when detailed scientific information about agriculture and/or livestock in the southern area are required.

Ras Hancorab

Members of the local community (several women and a man) who come to this area in the morning to serve tourists enjoying the beauty of the beach in this area were interviewed. They are nomads who sell local handicrafts to tourists and offer them tea and local pies. This group of people has no knowledge of, or interest in, the environment. Their main concern is economic and is related to their inability to sell their products and that tour operators, who bring tourists to this area, charge them a high percentage of their revenue. On another front, nomads feel that they are denied their right to the land as the border guards prevent them from staying in this area, saying it has been assigned to an investor.

Hamatah

Nature Protectorate Rangers

Meetings with some of the rangers were arranged as well as meetings with local officials in order to identify the ecological sensitivities of the area. The issues raised include:

- The four offshore islands of Hamatah (Mahabis, Aum El Shiekh, Shawarit and Sayal) are nesting places for sea turtles, in addition to the presence of coral reefs, sea

grass meadows and mangrove stands. These islands are also considered an important stop for migrating birds.

- The mangroves of Hamatah are invaluable and should be protected.
- Ras Baghdadi has sea grass meadows which support nesting sea turtles.
- Lack of toilets on Wadi Gemal Island creates environmental pollution.
- New development on the island may increase the frequency of illegal entrance, especially at night, and subsequent environmental damage.
- Installation of mooring buoys should be coordinated with Nature Protection staff in order to select the best locations and type of construction.
- There are some conflicts between diving and fishing activities by the locals. The locals actually complained about this.
- Both Wadi Gemal and Wadi Lahmy are rich in vegetation cover, specially following rainfall, which supports significant faunal diversity.
- Hamatah mountain is one of the biggest mountains of the area and it supports wild life diversity.
- One of the main pressing problems is the lack of any legislation to prevent dumping of boats' solid waste in the sea. Any increase in this activity will augment the problem. The rangers can't follow all boats due to limited resources. This issue should be taken into consideration when developing any new marinas or marine activities.

The local community has identified the following issues as their main concerns:

- Lack of good quality drinking water.
- Limited electricity service which negatively affects their livelihoods especially from fishing. This also negatively affects the medical services as the health unit can't keep antidotes against scorpions/snakes and can't perform any minor surgical operations.
- No system is in place for solid and medical waste, which affects the lives of children who may play with contaminated waste.
- Fishermen especially complained from the lack of good fishing gear and refrigerators in which to keep their yield. The tourism industry does not usually buy from them as their catches are usually small, due to their poor gear. In addition, the government has allowed fishermen from the Delta to fish in their grounds. Those incoming fishermen have up-to-date gear and they use un-environmental fishing methods, so their catches are bigger. Therefore, this competition has strongly affected the local fishing community.

Abu Ghusun

A focus group meeting was held with a group of locals representing almost all sectors of the community including officials (details are given in Annex 1). The main concerns and issues identified by this group included the following:

- Their main environmental concern is related to natural vegetation as they depend on it for herding their animals, medical uses and making of charcoal.
- The limited fish catch due to using outdated methods works against being able to sell the catch to local tourist resorts.
- The ban on coral fishing by the Nature Protection Department has negatively affected them as they were used to this type of fishing. The department however, has not given them any alternative.

- The local housing conditions are bad especially the methods of sanitary drainage that resulted in flooding of their homes. Due to this problem people go to the desert instead of using their toilets. If any plans exist to build new settlements they should consider this issue.
- Solid waste does not constitute a problem to them due to their customary behavior of dumping solid waste in the mountain areas.
- Complaints about the quality of water and related diseases were the same as in Hamatah.
- The locals acknowledged their good experience with the rangers to generate job opportunities and they would like to see this experience grow in the future.
- A great number of the locals are working in mining activities. The community fears that with the ending of such activities they will be without work.
- The local community feels that it has not benefited substantially from the tourism development. Individuals are in a disadvantaged position compared to Egyptians from the Nile Valley in terms of direct employment in large hotels (and also by other economic sectors) because they lack the capabilities and skills needed in large-scale luxurious tourism establishments. By contrast, eco-lodges offer more opportunities for the direct involvement of local communities and they are more willing to invest in local development.

Shalateen

Several meetings were held with City top officials, representatives of the Local Council, local community leaders, locals, NGOs, etc (details of people met are found in Annex 1). The main issues identified and the local concerns included the following:

- Solid waste due to commercial and camel markets is huge in quantity (some 50 ton/day). Dead animals create a special problem as they relate directly to the health of people. Currently, solid waste is dumped in the mountain some 5 km away from the city. Some people live inside the camel market and this adds to the environmental and health problems.
- Intrusion of alien plant species with soils used in transporting camels to Shalateen (placed under camels during transportation) represent an important problem. Although its impacts are not yet seen, it is anticipated to appear in the future if not dealt with now within a solid waste management plan.
- Vehicles' waste, especially used oils, are one of the main problems in the City as huge amounts are produced there.
- Technical assistance is badly needed to re-plan the market area and to prepare a good solid waste management plan especially with the limited manpower and resources.
- Sanitary drainage systems currently in place are not sufficient and may cause environmental problems in the near future.
- One of the main environmental concerns is their Acacia trees heritage. They prevented the plan for widening the roads as this plan would have caused the destruction of many of these trees.
- Natural vegetation and its diversity is so important for them as they use them to herd animals, make charcoal (only from dead trees) and to treat many of their illnesses.
- For them coral reefs and wild animals are natural resources that need to be protected.
- Fishermen complained from the Fisheries Resources Authority/Ministry of Agriculture as it allows fishermen from other regions to fish in the Red Sea area during times of spawning of many important fish species. As a result the fish stock is decreasing with negative consequences on their livelihoods. Also, as those recently-arrived fishermen do not know the nature of this area, they fish a lot of coral fishes,

which are not edible, so a huge amount of fish ends up being dumped in the sea or on land without using them.

- New urban development and urbanization negatively affect the behavior of wild birds as they refrain from landing to eat due to urbanization and the presence of man. This has to be taken into consideration while planning any new urban extensions in the future to provide enough vacant spaces for wild birds.
- Migratory locusts represent a great problem as they eat any vegetation in their path, thus depriving the nomads of food for their animals.
- Agriculture is one promising activity in this area but needs a lot of time to convince people who are used to herding animals to change to agriculture.
- The locals complained from the banning of carrying knives as they use them to slaughter their animals if they are sick. The government, due to security reasons, has banned them from carrying any sharp instruments.

Scoping activities with tourism sector

Tourism Investors

A meeting was held with the operators of Wadi Gemal camp (El Fostat) which is located within the Wadi Gemal National Park. This was taken as an example of an environmentally friendly investment that integrates local people into the development. Main issues identified included the biohazards connected to snake and scorpion bites for developments in the desert. For nomads to serve tourists some local hygiene customs interfere but these are dealt with through training. Lack of a reliable means of communications between the camp and rangers is also among the concerns identified. This is an important issue related to sustainability as in case of any emergencies lack of communication may result in bad injuries or death with subsequent negative political and economic impacts.

Tour Operators

A meeting with a tour operator representing the Italian Company "ALBA Tours" was held in Shams Alam resort. The points discussed and raised during the meeting included the following:

- Tourists usually complain about the damage they see to the corals.
- The tourists do not find any information (e.g. brochures) about the nature protectorates and their activities and how to visit or get tickets. Real examples were Wadi Gemal and Ras Samadai.
- The tour operator's view is that the staffs of Nature Protectorates are there only to prevent people from carrying out any activities in the protectorates.
- The lack of reliable communication means, medical services and formal means of awareness building to new comers to the Red Sea are among the main problems facing tour operators who should depend only upon themselves to secure all this.
- Lack of reliable and documented sources of information (who to ask and where?) about the area and its history is another important gap in tourism in the southern Red Sea area.

Scoping activities with Non-Governmental Organizations (NGOs)

Meetings and interviews were conducted with representatives of many NGOs located within the project area. The activities of these NGOs cover diverse fields including community development, women and child care, agriculture, livestock, fisheries and nature conservation. Some of the NGOs work on a local scale (e.g. Marsa Alam, Shalateen) while others cover the whole of the Red Sea area (e.g. Association for Development of Red Sea Nature Protectorates; Abu Salama Association).

Most of the interviewed NGOs work in community development issues and have little to do with environmental problems. However, they showed general concern about natural resources and solid waste. Both Association for Development of Red Sea Nature Protectorates and Abu Salama Association showed interest and concern about nature conservation in general as well as about waste management. These two NGOs are rather new in the Red Sea area but their members have good experience in their area of interest as many of them are working in the Nature Protection Department/Red Sea area.

The main issues of concern identified by NGOs regarding the project include:

- Importance of close coordination between project staff and Wadi Gemal Protectorate's officials.
- Impacts of toilets/pit latrines on the coastal and marine environment.
- Impact of trails and bird watching posts on wild bird populations' nesting and migration.
- Solid waste of safari boats that might increase as a result of developments along the SRSR.
- Introduction of new plant species to Wadi Gemal Protectorate.
- Solid waste management in tourist resorts and in Shalateen.
- Importance of integrating local people in development plans.

Annex 2

List of Stakeholders Met/Interviewed During the Scoping Phase

Red Sea Governorate

- General Mahmoud Osman El Gendy, LRS Coordinator and former Assistant General Secretary of Red Sea governorate
- Dr. Nabil Amin, Head of Environmental Management Department/Unit

Tourism Development Authority

- Dr. Mohamed Hassanien, Environmental Central Department

Egyptian Environmental Affairs Agency Nature Protection Department

- Ayman Afify, Head, Red Sea Protectorates
- Mohamed Gad, Head, Wadi Gemal Protectorate
- Mohamed Eid, Ranger
- Mohamed Negm, Ranger

Central Department for EIA

- Mr. Mohamed Farouk, Head, Red Sea Projects

Marsa Alam

- General Mostafa Basuny, Head of Marsa Alam City Council
- Information center manager
- Educational department manager
- Village development manager

Wadi Gemal Protected Area

- Local Nomads contracted by the Protectorate to assist in construction of the trails and entrances
- Workers at the material recovery site developed for Shams Alam hotel
- Protectorate Head and staff

Hamatah

- Mr. Ramadan Gomah Official in the municipality
- Mr. Mahmod Mohamed Official in the Municipality
- Mr. Gomaa Soliman Municipality Secretary
- Mrs. Gamalat Saleh Official in the Municipality
- Mrs Sanaa Abdelrahman Official in the Municipality
- Mr. Saad Ahmed School Headmaster
- Dr. Maged Abdelmalak Municipality Doctor
- Mr. Hassan Mohamed Shekh and The Secretary of Fishermen Cooperative and Secretary of Community Development Cooperative.
- Mrs. Amara Abdelsaleh Official in the Fishing Authority

- Mrs. Selema Mohamed House Wife
- Ms. Zenab Fared student
- Mr. Ahlamy Ateia Medical Care Technician
- Mr. Ali Ibrahim Fisherman
- Mr. Ahmed Ali fisherman
- Mr. Mohamed Saad Fisherman
- Mr. Abdelaal Mohamed Fisherman
- Mr. Abd Allah Esaa Fisherman
- Mr. Ahmed Gamel Allah Fisherman
- Mr. Esaa Baraka Fisherman
- Mr. Ibrahim Saad Fisherman
- Mr. Mohamed Ali Farag Environmental Guard
- Mr. Mohamed Negm Renger RSG
- Mr. Ossama Hossen Trader
- Mr. Ali Elsaid Seller
- Mr. Abd Elnoor Trader

Abu Ghosoun

- Mr. Abd Elhalem Ali *Retired Phosphate Company*
- Mr. Saad Mahmod *Retired Phosphate Company*
- Mr. Hassan Karar *Retired Phosphate Company*
- Mr. Mohamed Mahmod *unemployed*
- Mr. Hassan Mohamed *working on a daily bases in Phosphate Company*
- Mr. Abd Elrahman saad *Official in the Municipality*
- Mr. Farag Allah Saad *Environmental Guard*
- Naser Hassan *Student*

Shalateen

- Mr. Ramadan Mahmod *City Council Secretary*
- Mr. Ahmed Zaki *Deputy Mayor*
- Mr. Mohamed Sadro *The head of El Orban Committee*
- Mr. Othman Ali *Local Council Member*
- Mr. Abd Elbaset Ibrahim *Agricultural Directorate Manager*
- Mr. Nasser Hamed *Agricultural Council Secretary*
- Mr. Mohamed Gobran *Agricultural Department Accountant*
- Mr. Abd Elkader Mohamed *Social Directorate Manager*
- Mr. Gamal Fawzy *The Head of productive families branch in the social Directorate*
- Mr. Abd Elmaged Ahmed *cooperative Department manager*
- Mr. Ayman Abd Elradi *The head of the children and women affairs*
- Eng. Ahmed Morsy *Engineering Directorate Manager*
- Adam Hassan *Local Council Member and Deputy Chairman of the board of south Red Sea Protectorate Development cooperative*
- Mr. Othman Mohamed *Environmental researcher and The south Red Sea Protectorate Development cooperative Secretary*
- Mr. Mohamed Fakeeh *Environmental Guard*

Tourism Sector

El-Fotsat Camp

- Mr. Ibrahim Ahmed, Sales Manager

Tour Operators

- Mr. Mamdouh Mahmoud, ALBA Tours Company

Non-Governmental Organizations

- Ayman Afifi, Head, Abu Salam Association
- Mohamed Gad, Head, Association for Development of Southern Red Sea Protectorates

Annex C.2: LIFE Red Sea Scoping Statement Approval



**U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
BUREAU FOR ASIA AND THE NEAR EAST
WASHINGTON, D.C. 20523**

**RECORD OF ENVIRONMENTAL DECISION
ANE 06-53 Egypt ROD PEA Scoping Statement LIFE Red Sea**

Country Code-SO: 263-016

SO Name: Livelihood and Income from Environmental Program (LIFE)

Country or Region: Egypt

Activity Name: Record of Decision (ROD), Scoping Statement of Programmatic Environmental Assessment (PEA), Livelihood and Income from the Environmental Program (LIFE) Red Sea Project

Funding Begin: FY 2004 **Funding End:** FY 2006 **Funding Amount:** \$5,600,000

Approval Issue: Scoping Statement for Programmatic Environmental Assessment

CLEARANCE:

Deputy Mission Director

Approval: _____ (signed) _____ February 22, 2006
Mary Ott Date

Associate Director for Productive Sector Development

Approval: _____ (signed) _____ February 21, 2006
Anthony Vance Date

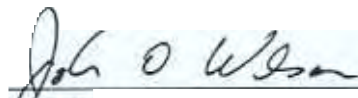
LEG Approval: _____ (initialed) _____ January 30, 2006
Mark Driver Date

Private Sector Development

Approval: _____ (initialed) _____ January 29, 2006
Gary Robbins Date

Mission Environmental Officer

Approval: _____ (signed) _____ January 19, 2006
Seifallah Hassanein Date

CONCURRENCE:Bureau Environmental
Officer
John ODate: 3/16/2006
Approved: ☒
Disapproved: ☐**OVERVIEW**

USAID/Egypt plans to fund the "Programmatic Environmental Assessment (PEA), Livelihood and Income from the Environmental Program (LIFE) Red Sea Project." Focused on the Wadi Gimal Protectorate, the project received a positive threshold environmental decision on September 2, 2003 (ANE 03-53), requiring preparation of a scoping statement for an Environmental Assessment (EA) per 22 CFR 216. The EA process expanded to a PEA because, although the project identified the intervention types, the number and location of interventions are to be determined. The project's goals are: 1) provide jobs and upgrade living conditions for native inhabitants; 2) promote environmentally sustainable tourism; and 3) develop the park infrastructure and management systems. The project will: 1) assist the local population in obtaining jobs and upgrade housing conditions in some depressed settlements through improvement of services and infrastructure; 2) assist the Egyptian Ministry of Tourism and tourism investors to built environmentally sustainable tourism facilities through technical assistance and training; and 3) provide the park with the necessary infrastructure, equipment, and training to establish a functioning and sustainable park. Physical interventions consist of construction or repair of: 1) basic park infrastructure and facilities (ranger outposts, park headquarters, natural and vehicle trails, campgrounds, mooring, beach facilities); and 2) community development infrastructure and facilities (community centers, septic tanks, fresh water tanks, standpipes, upgrading homes, model home construction, small solid waste dumps, material recovery facilities).

The scoping process included meetings with these stakeholders: Egyptian Environmental Affairs Agency (EEAA), Red Sea Governorate (RSG), Tourism Development Authority (TDA), Red Sea City Councils, non-governmental organization (NGO), local residents groups, scientific community, safari operators, and tourist hotel owners and staff. Scoping sessions identified these issues: solid waste, imported building materials and architectural styles, cutting Acadia trees, hiking and driving off trails, sewage disposal, alien plants, housing conditions for the local indigenous groups, resource conflicts between communities and developers, compliance with RSG policies and plans, coordination with EEAA's Nature Protection Department, community participation, coordination with multiple projects, and animal carcass disposal. In addition to these issues, the PEA will address these significant issues: airborne dust, soil erosion, noise levels, and unsafe working conditions during construction; and impacts of any potential relocation of households in existing communities.

DECISION

The Scoping Statement for the Programmatic Environmental Assessment for Egypt's LIFE Red Sea Project is **approved**.

File No: ANE 06-53 Egypt ROD PEA Scoping Statement LIFE Red Sea

DISTRIBUTION:Mission Environmental Officer
ROD File



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APPROVAL OF SCOPING STATEMENT

ANE 06-53 EGYPT SCOPING STATEMENT LIFERED SEA

Project Location: Egypt
263-016
Strategic Objective: SO-16; Environment for Trade and Investment Strengthened
Project Title/ID: Livelihood and Income from the Environment Program (LIFE); Red Sea Component (# 263-290);
Fiscal Year and Amounts: FY 04 – FY 06, \$5.6 million, LE 47.8 million

Prepared by:

Date:

Seifalla Hassanein

3 2006

Seifalla Hassanein
CTO & Mission Environmental Officer

Associate Director Concurrence:

Date:

Anthony Vance
Anthony Vance
Associate Director for Productive Sector Development

2/21/06

Deputy Mission Director Concurrence:

Date:

Mary C. Ott
Mary Ott
Deputy Mission Director

2-22-06

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**Decision of Bureau Environmental Officer,
Bureau for Asia and the Near East:**

Approved: for D Wren

Disapproved: _____

Date: 3/15/06

Clearances:

LEG, MDriver
PSD/E, GRobbins

ALD date 30 Jan 06
R date 29 Jan 06

Copy:

PSD/E, Sylvia Atalla
PSD/E, Mohamed Abdel Rahman

Annex D: LIFE Red Sea PEA Approval



USAID
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**U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
BUREAU FOR ASIA AND THE NEAR EAST
WASHINGTON, D.C. 20523**

**RECORD OF ENVIRONMENTAL DECISION
ANE 06-59 Egypt ROD PEA LIFE Red Sea**

Country Code-SO: 263-016
SO Name: SO-16, Livelihood and Income from Environmental Program
Country or Region: Egypt
Activity Name: Record of Decision (ROD), Programmatic Environmental Assessment (PEA),
Livelihood and Income from the Environmental Program (LIFE) Red Sea Project

Funding Begin: FY 2004 **Funding End:** FY 2006 **Funding Amount:** \$5,600,000

Approval Issue: Environmental Assessment, Approved

CLEARANCE:

Associate Director for Productive Sector Development

Approval: _____ (signed) _____
Anthony Vance

April 3, 2006
Date

Deputy Mission Director

Approval: _____ (signed) _____
Mary Ott

April 4, 2006
Date

Legal Advisor

Approval: _____ (initialed) _____
Mark Driver

March 26, 2006
Date

Private Sector Development

Approval: _____ (initialed) _____
Gary Robbins

March 22, 2006
Date

Mission Environmental Officer

Approval: _____ (signed) _____
Seifalla Hassanein

March 20, 2006
Date

CONCURRENCE:

Bureau Environmental
Officer

John O. Wilson
John O. Wilson

Date: April 6, 2006
Approved: ☒
Disapproved: ☐

OVERVIEW

USAID/Egypt plans to fund the “Programmatic Environmental Assessment (PEA), Livelihood and Income from the Environmental Program (LIFE) Red Sea Project.” Focused on the Wadi Gimal Protectorate, the project received a positive threshold environmental decision on September 2, 2003 (ANE 03-53), requiring preparation of a scoping statement for an Environmental Assessment (EA) per 22 CFR 216. The EA process expanded to a PEA because, although the project identified the intervention types, the number and location of interventions are to be determined. The project’s goals are: 1) provide jobs and upgrade living conditions for native inhabitants; 2) promote environmentally sustainable tourism; and 3) develop the park infrastructure and management systems. The project will: 1) assist the local population in obtaining jobs and upgrade housing conditions in some depressed settlements through improvement of services and infrastructure; 2) assist the Egyptian Ministry of Tourism and tourism investors to build environmentally sustainable tourism facilities through technical assistance and training; and 3) provide the park with the necessary infrastructure, equipment, and training to establish a functioning and sustainable park. Physical interventions consist of construction or repair of: 1) basic park infrastructure and facilities (ranger outposts, park headquarters, natural and vehicle trails, campgrounds, mooring, beach facilities); and 2) community development infrastructure and facilities (community centers, septic tanks, fresh water tanks, standpipes, upgrading homes, model home construction, small solid waste dumps, material recovery facilities).

The scoping process (ANE 06-53), approved March 16, 2006, included meetings with these stakeholders: Egyptian Environmental Affairs Agency (EEAA), Red Sea Governorate (RSG), Tourism Development Authority (TDA), Red Sea City Councils, non-governmental organization (NGO), local residents groups, scientific community, safari operators, and tourist hotel owners and staff. Scoping sessions identified these issues: solid waste, imported building materials and architectural styles, cutting Acacia trees, hiking and driving off trails, sewage disposal, alien plants, housing conditions for the local indigenous groups, resource conflicts between communities and developers, compliance with RSG policies and plans, coordination with EEAA’s Nature Protection Department, community participation, coordination with multiple projects, and animal carcass disposal. In addition to these issues, the PEA addresses these significant issues: airborne dust, soil erosion, noise levels, and unsafe working conditions during construction; and impacts of any potential relocation of households in existing communities.

DISCUSSION

The EA for the LIFE Red Sea project addresses the scoping statement issues, identified potential significant environmental impacts, and developed and evaluated mitigation measures.

DECISION

The EA for the LIFE Red Sea project is **Approved**.

File No: ANE 06-59 Egypt ROD PEA LIFE Red Sea

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Mission Environmental Officer
ROD File



ANE 06-59 Egypt PEA Life Red Sea Approval Memo

APPROVAL OF PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

Project Location: Egypt

Strategic Objective:

263-016

Project Title/ID:

SO-16; Environment for Trade and Investment Strengthened

Livelihood and Income from the Environment Program (LIFE); Red Sea Component (# 263-290);

Fiscal Year and Amounts: FY 04 FY 06, \$5.6 million, LE 47.8 million

Prepared by:

Date:

Seifalla Hassanein

3.20.06

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**Decision of Bureau Environmental Officer,
Bureau for Asia and the Near East:**

Approved: JOL O Wilson

Disapproved: _____

Date: April 6, 2006

Clearances:

LEG, MDriver M.D. date 26 MAR 06
PSD/E, GRobbins GR date 22 MAR 06

Copy:

PSD/E, Sylvia Atalla

PSD/E, Mohamed Abdel Rahman

BACKGROUND:

Attached for your approval is the Programmatic Environmental Assessment (PEA) for the Red Sea component of the Livelihood and Income from the Environment (LIFE) Program. This component has received a Positive Threshold Decision from the Bureau Environmental Officer on September 2, 2003, and the Scoping Statement for the PEA was approved by the Bureau Environmental Officer on March 16, 2006.

The LIFE Red Sea focuses on the Wade Gimal Protectorate in the Southern Red Sea area. The project has three main goals: (1) Provision of jobs and upgrading of living conditions for native inhabitants in and around Wade Gimal; (2) Promotion of environmentally sustainable tourism development in and around Wade Gimal; and (3) Development of the Wade Gimal park infrastructure and management systems.

To achieve these goals the project will: (1) Assist the local population in obtaining jobs and upgrade housing conditions in some of the depressed settlements through the improvement of infrastructure and services; (2) Assist the Ministry of Tourism and tourism investors to build environmentally sustainable tourism facilities through the provision of technical assistance and training; and (3) Provide Wade Gimal with the necessary infrastructure, equipment and training to establish a functioning and sustainable park.

Wade Gimal is a recently established marine and terrestrial protectorate in the Southern Red Sea, located 325 km south of Hurghada. The protectorate includes a marine component of 1,600 sq. km, and a terrestrial component of 4,400 sq. km. Wade Gimal has a coastal strip of 100 kms and extends approximately 15 kms in the sea, and approximately 55 kms in the mountainous hinterland. The Protectorate includes a number of islands and reefs and a number of valleys (wades), and some antiquity sites. The protectorate also includes a number of small housing settlements and hotels. The housing settlements are inhabited mainly by native tribes and migrants from nearby governorates in Upper Egypt. The total population inside the protected area is 1,000 inhabitants. The total population covered by the project area (which includes the protectorate and adjacent areas) is 7,800 inhabitants.

Given the nature of the project, which includes some relatively small interventions in very dispersed locations (some locations are located as far as 150 kms from each other) it was deemed more practical and more useful to replace the traditional Scoping Session (the large scoping session) with a series of small scoping sessions and focused meetings with the various stakeholders in their relevant locations, discussing the interventions that are relevant to their areas. The project physical interventions consist of the following:

- (1) Basic park infrastructure and facilities: ranger outposts, park headquarters, natural trails, vehicle trails, campgrounds, mooring buoys, beach park facilities, etc.

- (2) **Community Development infrastructure and facilities:** Community center(s); septic tanks, fresh water tanks, standpipes, upgrading of individual homes, construction of model homes, small solid waste dumps and material recovery facilities, etc.

The project decided to opt for a Programmatic Environmental Assessment (PEA) since the project had identified the type of interventions required but it wasn't yet clear how many of the interventions (mentioned above) were going to be implemented or the exact location within the project boundaries. Such decisions will evolve when the plans are fully developed. Therefore the PEA will look at the types of suggested activities in the given project area and develop a set of best practices and environmental mitigation measures to eliminate or minimize any potential negative impact on the environment from these types of activities in the geographical area of the project.

DISCUSSION: The Programmatic Environmental Assessment (PEA) for the LIFE Red Sea Component follows the LIFE Red Sea Scoping Report which was approved by the USAID/W Asia Near East (ANE) Bureau Environmental Officer on March 16, 2006.

USAID/Egypt contracted with Chemonics International Inc. to implement the LIFE Red Sea technical assistance component and prepare this PEA report. In conformance with 22 C.F.R. 216.6 (d), therefore, to the extent practicable, the form and content of this Programmatic Environmental Assessment is the same as a regular Environmental Assessment and includes the following chapters:

- Executive Summary: which summarizes the report, and the major PEA conclusions (potential impacts, recommended mitigation measures and environmental management plan);
- Section One: Introduction to the LIFE RS project, which includes the project purpose and objectives;
- Section Two: Background on the PEA, this section includes the rationale for the PEA approach and the scoping methodology;
- Section Three: Description of the Affected Environment, which describes the affected environment under the LIFE Red Sea project which covers the Southern the Red Sea sector;
- Section Four: Description of Proposed Activities, which is a review of all the potential physical interventions in the given geographic area of the project;
- Section Five: Potential Environmental Impacts, which reviews the various type of interventions and their potential impacts in the Southern Red Sea Sector;
- Section Six: Recommended Mitigation Measures, which describes the recommended mitigation measures for the potential impacts described in Section Five;

Section Seven: Alternatives Analysis, which describes why this Programmatic Environmental Assessment does not include a traditional alternatives analysis section;

Section Eight: Environmental Management Plan, which describes the implementation of mitigation measures and the environmental monitoring plan;

Annex A: List and Brief Description of PEA Team members;

Annex B: LIFE Red Sea IEE and Approved PEA Scope of Work; and

Annex C: Approved LIFE Red Sea Scoping Statement.

The March 2006 LIFE Red Sea Programmatic Environmental Assessment identified the potential impacts of a comprehensive list of planned physical interventions. The PEA then reviewed the impacts of each of these types of interventions in the given geographic area (Southern Red Sea Sector) during the construction and operational phases, and recommended mitigation measures that would eliminate or reduce the negative impacts of any of these interventions to an acceptable level. The report also provides an Environmental Management Plan (EMP) for the implementation of the mitigation measures and the monitoring of the environmental performance of the planned physical interventions.

The LIFE Red Sea PEA is therefore a fairly comprehensive manual for the planning, implementation and operation of a large number of basic physical interventions in the Southern Red Sea Sector in an environmentally sound fashion.

CONCLUSION: The Programmatic Environmental Assessment for the LIFE Red Sea Project in the Southern Red Sea Sector was prepared in accordance with 22 C.F.R. 216.6 (Environmental Assessments).

If the planned physical interventions in the LIFE Red project are designed, implemented, and operated in accordance to the recommended considerations in the PEA, then these actions will have minor or no impact on the environment, and will have no cross-sector or cumulative impacts. Any potential negative or minor negative impacts will be fully addressed through adoption of the mitigation and monitoring measures proposed in this PEA. When implemented in accordance to the PEA recommendations, the Planned physical interventions offer substantial community development, public health, economic, or environmental conservation benefits relative to the No-Action Alternative.

RECOMMENDATION: The Mission recommends that the ANE Bureau Environmental Officer approves the Programmatic Environmental Assessment of the LIFE Red Sea project.

